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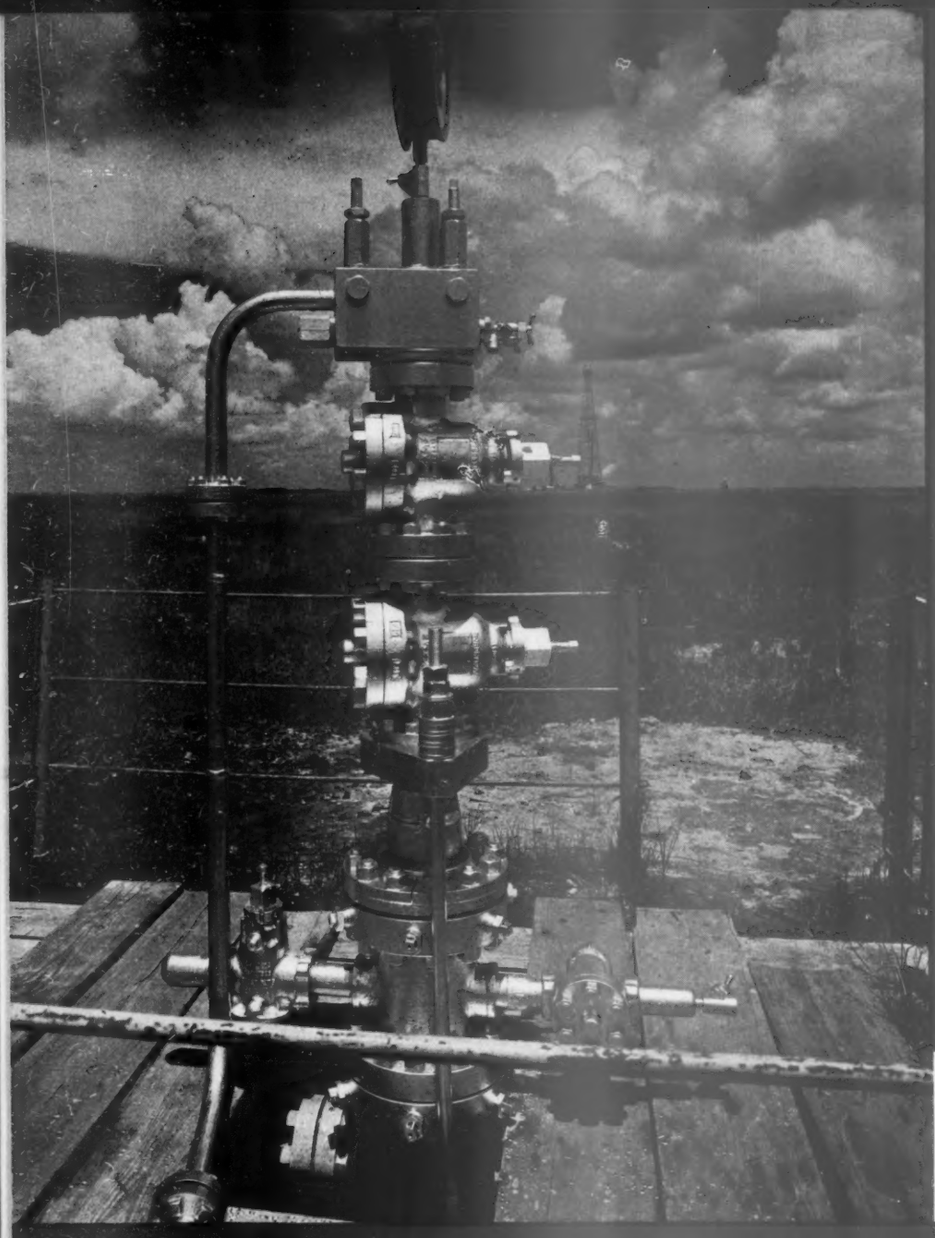

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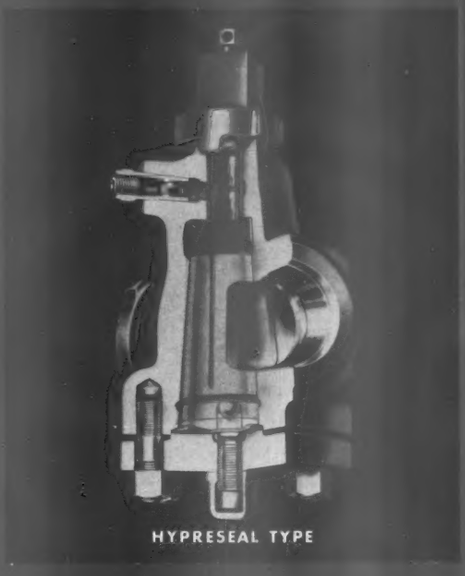

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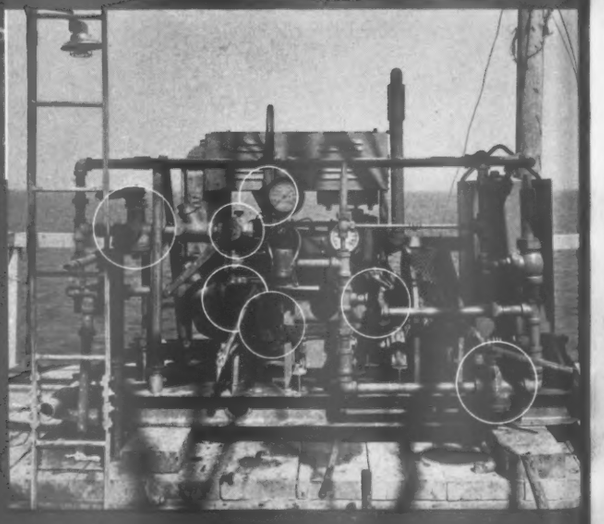

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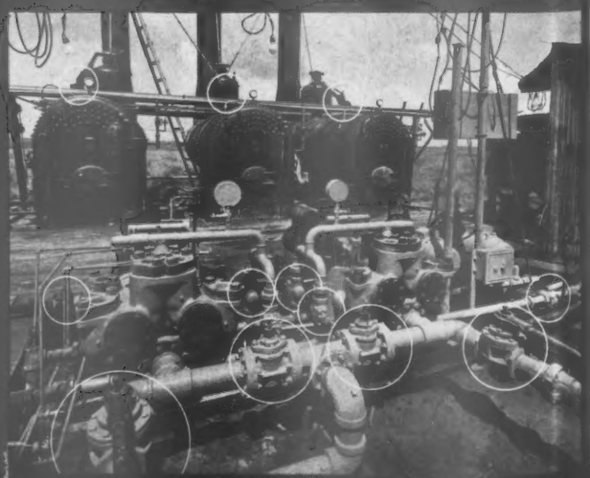

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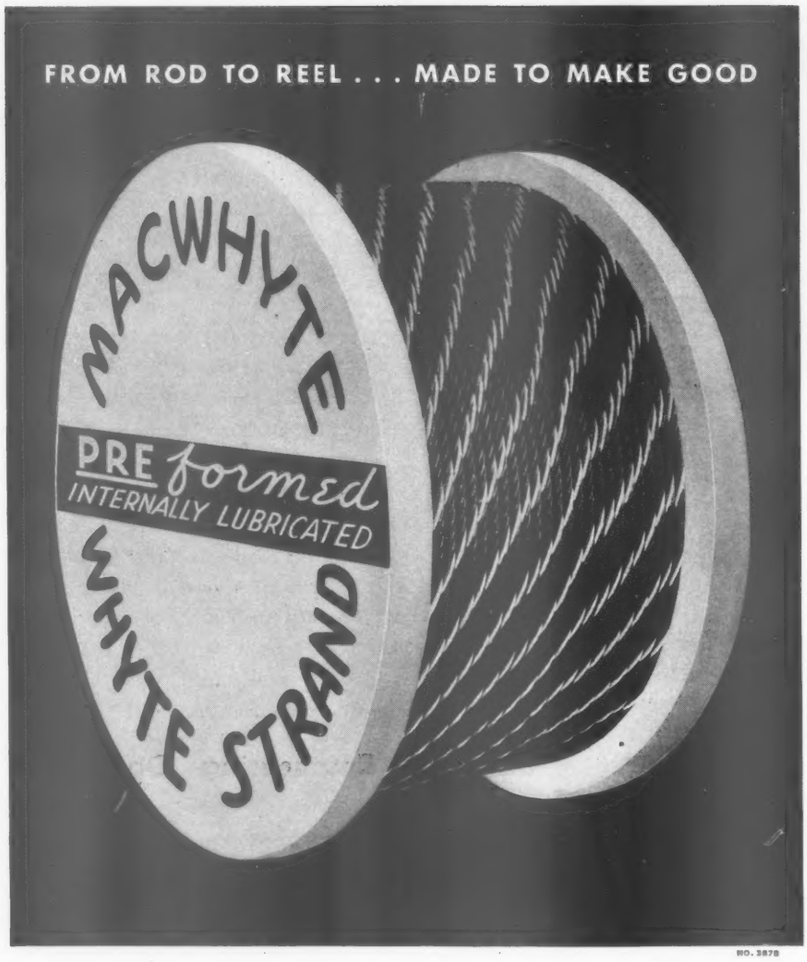

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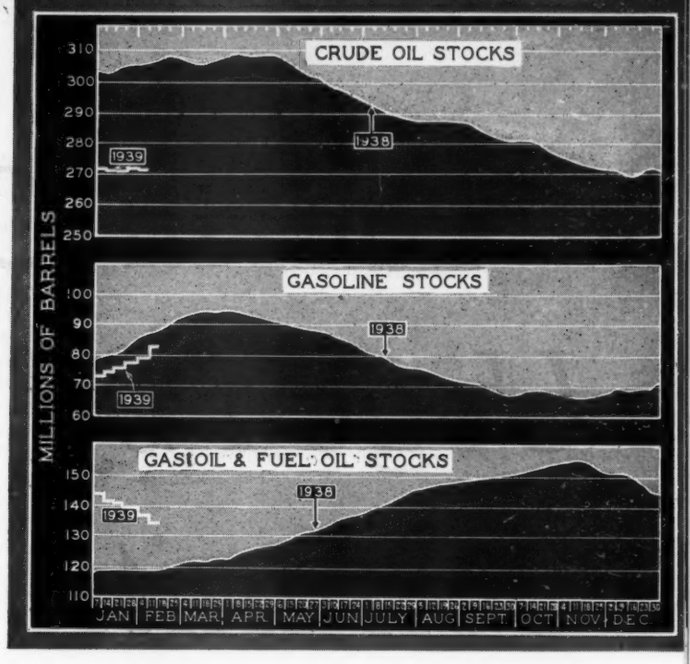
Trends

Crude Production in Excess of Estimated Needs for February



INCREASES in Oklahoma, California and Kansas largely accounted for the gain of 39,776 bbls. daily in crude oil production last week. The output was the largest of any week since December 1 with the exception of two weeks during which one of the two-day shutdowns effective in Texas was lifted.

CRUDE PRODUCTION *3,320,961 barrels daily average — up 39,776. One year ago 3,368,242 barrels.*

CRUDE STOCKS *271,553,000 barrels as of February 11—down 661,000. One year ago 304,915,000 barrels.*

GASOLINE STOCKS *83,075,000 barrels as of February 18—up 2,125,000. One year ago 89,992,000 barrels.*

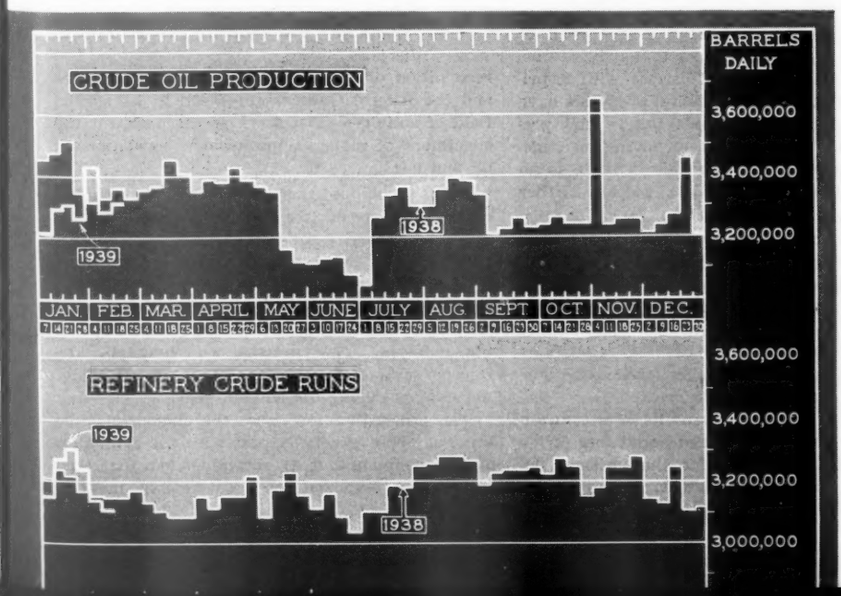
GAS AND FUEL OIL STOCKS *135,096,000 barrels as of February 18—down 2,145,000. One year ago 120,940,000 barrels.*

REFINERY RUNS *3,125,000 barrels daily week ending February 18—down 5,000. One year ago 3,149,000 barrels.*

The upward trend in crude oil output in recent weeks has brought about a situation in which the total is now approximately 100,000 bbls. daily in excess of Bureau of Mines estimated requirements and in excess of allowables in four states. It is apparent that the objective of keeping February production within the January average will not be accomplished. On the West Coast, California operators have been unable to keep their output under 610,000 bbls. daily, the production last week being 24,000 bbls. daily in excess of that average.

In the remainder of the United States weakness continues to center in Illinois and in a few scattered areas in Texas and Louisiana where buyers are taking more crude than they want. Illinois crude is being widely offered under the posted schedules. In most cases these offers come from tankcar operators with limited pipe line or delivery facilities. The offers to sell usually are for spot crude or deliveries not exceeding 30 days. It is expected that enlarged pipe line facilities and improved weather conditions will result in Illinois' production increasing to 175,000 or 200,000 bbls. daily in another 30 days.

Some improvement is noted in the gasoline market in that sellers are resisting the efforts to bring about lower quotations for their principal product. The gasoline stocks situation is improved over a year ago in several refining areas. For the entire country, gasoline stocks on February 11 were 7,444,000 bbls. or 8.5 per cent less than one the same date of the previous year. Refining areas with more than average reductions are Appalachian, 9.5 per cent; Inland Texas, 31 per cent; Texas Gulf, 20 per cent and Rocky Mountains, 23 per cent. Oklahoma and Kansas stocks are about the same as a year ago and Louisiana Gulf slightly more.



DAILY AVERAGE PRODUCTION FOR WEEK

	Feb. 18, 1939	Bur. Mines Feb. est. of demand	Feb. state allowables	Feb. 11, 1939
Oklahoma City	111,425	.....	.....	100,950
Fitts	31,250	.....	.....	31,425
Remainder of state	301,800	.....	.....	300,825
Total Oklahoma	444,475	482,500	428,000	433,200
East Texas	372,397	.....	.....	372,750
West Texas	206,348	.....	.....	205,500
North Central Texas	110,000	.....	.....	109,120
Texas Panhandle	60,446	.....	.....	64,196
East Central Texas	91,805	.....	.....	91,893
Gulf Coast Texas	356,948	.....	.....	351,750
Southwest Texas	106,345	.....	.....	105,896
Total Texas	1,304,289	1,297,500	1,319,542	1,301,105
North Louisiana	69,280	.....	.....	72,380
Gulf Coast Louisiana	195,350	.....	.....	192,850
Total Louisiana	264,630	246,800	255,140	265,230
California	634,200	580,000	610,000	617,500
Kansas	152,425	148,600	153,900	144,600
Arkansas	53,325	48,200	.....	53,150
Eastern fields	94,800	94,300	.....	94,750
Illinois	149,816	102,500	.....	149,867
Michigan	53,971	47,200	.....	54,193
New Mexico	104,370	99,600	99,600	102,600
Rocky Mountain area	64,660	72,800	.....	65,000
Total United States	3,320,961	3,220,000	.....	3,281,185

In gas oil and fuel oils, the stock situation is better at coastal points than at the inland refining centers. California is an important exception to this rule with an increase of 20,000,000 bbls., which exceeds the national gain. Stocks of these heavier oils compared to a year ago are 23 per cent larger in the case of Oklahoma and Kansas and generally greater in all the refining centers of the Mid-Continent.

These large stocks of heavy oils in the Mid-Continent are reflected in a weak market at this time despite the fact that this is normally the heaviest consuming period of the year. Faced with a seasonal decline in shipments starting soon, some refiners are offering price concessions in order to liquidate inventories.

Federal Control of Oil Urged by Resources Committee

By HENRY D. RALPH

WASHINGTON, D. C., Feb. 20.—Recommendations by the National Resources Committee for federal control of the petroleum industry and for moderate federal participation in the control of stream pollution were submitted to Congress by President Roosevelt in two special messages last week.

The recommendation for federal oil legislation was contained in a report by the National Resources Committee, and while the president did not specifically endorse this recommendation, he submitted the report to Congress as "a useful frame of reference for legislative programs." The pollution message was also accompanied by a special report of the National Resources Committee and in this case the president specifically endorsed the proposals and recommended stream pollution legislation along the general lines of the bill he vetoed last year for technical budgetary reasons.

The recommendation for federal oil control, together with other proposals affecting the oil industry, forms part of a special survey of energy resources made by the National Resources Committee at the request of President Roosevelt last March, presumably as the result of agitation in Congress last spring for a tax on fuel oil.

Recommendations

The report recommends creation of a federal energy resource planning body to coordinate federal policies respecting oil, gas, coal, and water power.

The National Resources Committee summarized the regulatory recommendation as follows:

"We propose that a federal oil conservation board or commission should be created within the appropriate government department to administer the federal interest in the oil and gas industry and to make necessary rules and regulations concerning the production of and commerce in oil and gas. It should have the authority to require that oil and gas be extracted by such methods as are adequate to avoid waste and to protect the interest of all producers drawing from a common reservoir.

"It is recognized that the development of minimum standards for the production and transportation of oil and gas designed to further the national interest in conservation of these resources is a complex problem, and that such standards should be developed in cooperation with the state regulatory agencies and the representatives of industry. It is recommended, therefore, that the Connally Act be extended for such time as may be necessary for the framing and enactment of an adequate federal oil and gas measure."

Leading up to this recommendation, the report states, in part:

"The rank of petroleum as a source of energy, its vital importance in national defense, its vulnerability to destructive forces and exploitation, and its comparatively small reserve in comparison with the high rate of withdrawal place this commodity in a unique position among the natural resources. The welfare of the nation is so dependent upon a continuous and reasonably priced supply of motor fuel, lubricants, and other petroleum products as to demand the consideration of petroleum from the standpoint of national policy. . . Since 1924 the federal Government has in numerous ways indicated that private operation of the petroleum industry should not run contrary to the welfare of the country as a whole. The interest of the federal Government in petroleum revolves around the central problem of maintaining an adequate supply at a reasonable price just as long as possible.

"In spite of all that is known concerning production methods, however, there is no way in most states by which those who desire to produce oil without waste can enforce their wishes upon those who prefer to exploit wastefully. . . Although proration to market demand is sometimes referred to as a conservation method, such laws do not necessarily result in the prevention of underground waste. It is, of course, possible that the quantity of oil permitted to be withdrawn from a given oil pool may be the proper quantity with respect to the most efficient operation of the pool, but it does not follow that it has to be. Proration to market demand carries with it primarily the idea of price. . . Several proposals have been suggested as to methods that would prevent marketing conditions from having an undesired result upon production, but as there is no obvious solution, this problem merits further consideration. . . .

"The problem of conservation has not been solved by the regulation of the petroleum industry now in force in those states that have laws. No state is now in position to protect itself from another state, and consequently no state can in equity to its own industry enforce regulations appreciably more effective than those of other states competing for the same market. . . .

"In order to secure the benefits of a continuous stream of reasonably priced liquid fuel for as long a period as possible for the national defense, for the people as a whole, for all of the states, oil producing and non-oil producing, and to protect those states that desire conservation against those considering only the immediate gain, the federal Government should be in position, in cooperation with the states and the industry, to establish standards for production designed to prevent waste, to encourage conservation, and to protect interstate and foreign commerce from the burden of oil produced in violation of such standards. It may or may not be possible legally to require oil moving solely in intrastate commerce to be produced in accordance with federal standards, but it must be recognized that, regardless of whether the oil moves outside of the state in which it is produced or is consumed within the state, any oil ultimately affects all other oil.

"As more than half of the natural gas produced is incident to the production of oil and as the production of such gas is directly related to oil conservation methods, most of the problems of gas production would be solved by the establishment of standards for oil production.

Change Advocated

"The change from the present system does not need to be drastic, although more uniformity and better coordination are imperative. To achieve these ends an appropriate federal agency would be required to administer the federal interest in oil and gas conservation.

"Considerable advance in conservation laws, regulations, and enforcement has been made in several states during recent years, and federal legislation in the form of the Connally Act has supplemented such state activity. Work already accomplished has the advantage of having been tested legally, and a substantial recognition of the validity of these conservation efforts had been accorded. The gains so far accomplished by some of the states and the federal Government should not be lost, and further legislation should be built upon this foundation of state and federal cooperation. The Connally Act has demonstrated the possibilities of such cooperation. The recognition of the mutual interests of the states and the federal Government—each in its special field of activity—must serve as the basis for the enactment of more comprehensive legislation on oil and gas.

"It is recognized that the development of minimum standards for the production and transportation of oil and gas designed to further the national interest in conservation of these resources is a complex problem, and that such standards should be developed in cooperation with the state regulatory agencies and the representatives of the industry. This process will inevitably be time-consuming. In the meantime, the Connally Act expires during the current year.

"In order, therefore, that the change may be brought about gradually and with the minimum of readjustments, it is recommended that this measure be extended for such time as may be

necessary for the framing and enactment of an adequate federal oil and gas measure.

"Therefore, it is further recommended that such a federal measure be enacted defining in general terms minimum standards for the production and transportation of oil and gas; creating an appropriate federal administrative agency; and providing for the conduct of hearings by that agency in order that the experience of the federal Government, the state regulatory commissions, and the industry may be pooled in the establishment of detailed standards and regulations designed to protect the national interest in the scientific production and conservation of these irreplaceable resources. It is recommended, also, that such legislation provide a reasonable period —say six months—between the promulgation of these regulations and their enforcement to give the state regulatory agencies opportunity to bring their own regulations in conformity with the minimum national standards, thereby minimizing the necessity of federal supervision."

Field for State Legislation

The field for state legislation outlined in the report lies primarily in changing "the mischievous law of capture" and substituting the rule of ownership in place and the recognition of correlative rights in an underground reservoir which would allot to each producer that proportion of the oil and gas in the common reservoir which underlies the land he owns or controls. The rule of ownership in place is essential if scientific development and operation of oil fields or reservoirs is to be generally adopted, the report declares, and in requiring unit operation major commercial exploitation should be delayed until the completion of careful studies to determine pool limits, the nature of the reservoir, and other pertinent scientific data.

In opposing petroleum import restrictions, the report states:

"In response to requests from congressional committees for comments upon bills dealing with this subject, the department has taken the position that wise national policy would tend to avoid rather than to seek the imposition of any obstacles to the importation of petroleum, since such action would have the effect of hastening exhaustion of a limited and irreplaceable natural resource. The petroleum products normally imported into this country are, generall speaking, complementary to American petroleum products, yielding a high proportion of heavy fuel oil and asphalt, both of which are in demand in this country and unobtainable, at least in quantity and quality, except from California fields."

In defending the constitutional right of the federal Government to regulate the production of petroleum, the report makes much of recent Supreme Court decisions under the National Labor Relations Act, and it is declared the courts have held that although activities may be intrastate in character when separately considered, Congress cannot be denied the power to regulate them if they have such a close relation to interstate commerce that their control is appropriate to protect that commerce from obstruction. Particular stress is laid on the case in which the Labor Board was given jurisdiction over an electric utility company whose operations are entirely intrastate in character but which furnishes services essential to the maintenance of interstate commerce, and the report declares:

"This decision would seem to furnish a basis for federal regulation of production of oil and gas and of conservation measures looking to the protection of the public against the waste of an irreplaceable resource. The production and transportation of oil and gas make up a stream of interstate commerce so continuous and so widespread and so vital to the country that the legal basis for protection of the federal interest is scarcely subject to debate.

"Ineffective conservation of oil and gas resources will hasten the rise in prices which the agencies of commerce and other consumers will have to pay for their fuel. The consequences of waste of oil and gas and the early exhaustion of limited resources would surely result in a far more severe interruption to interstate commerce than would a strike in an electric power plant in New York City. In addition, the power of the federal Government to provide for the national defense offers a sound basis for regulation aimed at conservation of oil and gas. In time of war this power would undoubtedly become operative, but the adequacy of a future supply, imperatively requires peace-time protective measures.

"Not only are petroleum products essential to the Army and Navy but it is true also that manufacturing and transportation facilities, vital to the Army and Navy, are dependent for their continued operation upon petroleum. It has been estimated, for example, that during a national emergency the demand for petroleum would increase by one-fourth. At the present rate of consumption this increase would amount to about 800,000 bbls. per day. Just as the Supreme Court has within recent weeks held that the exertion of the federal power does not have to await the disruption of services essential to the maintenance of interstate commerce, so may it be declared with emphasis that the exercise of the power to provide for the national defense does not have to await the arrival of a national emergency. Petroleum is vital in the national defense, and to defer the application of adequate conservation measures until the declaration of a national emergency is almost as illogical as to defer similarly the construction of battleships."

Members of Committee

The National Resources Committee is composed of the secretaries of interior, war, commerce, labor, and works progress administrator, and Frederic A. Delano and Charles E. Merriam. The energy resources committee, which prepared the report, was headed by Ralph J. Watkins, assistant administrator of the Wages and Hours Division of the Department of Labor and formerly director of the Bureau of Mines Research of the University of Pittsburgh. Other members were Capt. F. A. Daubin, U. S. Navy, Army and Navy Munitions Board; Charles W. Eliot, II, executive officer of the National Resources Committee; A. C. Fieldner, Bureau of Mines; John W. Frey, Petroleum Conservation Division; Roger B. McWhorter, Federal Power Commission; W. C. Mendenhall, director, U. S. Geological Survey; Col. H. K. Rutherford, Army and Navy Munitions Board; F. C. Tryon, Bituminous Coal Commission, and Joel D. Wolfsohn, National Power Policy Committee. Research assistants to Mr. Watkins were Wilbur G. Fritz, Glenn E. McLaughlin, and James P. Watson, all of the bureau of business research of the University of Pittsburgh. Special contributions were also received from George H. Ashley, director of the Pennsylvania Geological Survey; Paul L. Hopper, of the Bureau of Foreign and Domestic Commerce; P. Burke Jacobs, of the Bureau of Chemistry and Soils; Leland Olds, of the New York Power Authority; Lewis L. Lorwin and Arthur Wubnig, of the International Labor Office; H. C. Dickinson, of the Bureau of Standards; R. A. Cattell, H. C. Fowler, H. A. Kramer, A. G. White, and H. F. Yancey, Bureau of Mines, and C. H. Dane, T. A. Hendricks, H. D. Miser, R. W. Richards, and C. B. Richardson, Geological Survey.

The Committee Asserts:

The federal Government has power to regulate the oil and gas industries under the interstate commerce and national defense clauses of the Constitution.

A federal oil conservation board should be created with power to establish minimum standards for the production of oil moving into interstate commerce.

The Connally "hot oil" law should be extended until such time as permanent federal legislation can be enacted.

More rigorous state oil conservation laws should be enacted, to be coordinated with federal regulation.

State legislation should terminate the law of capture and substitute the law of ownership in place and require unit operation of all oil pools.

There should be no tariff duty or import tax on petroleum products.

Naval oil reserves should be consolidated and resurveyed.

The federal Government should assert ownership of submerged oil and gas reserves underlying all coastal waters.

Southeast Coalinga Likely [illegible] California [illegible]

By L. P. STOCKMAN

LOS ANGELES, Calif., Feb. 20. Each succeeding completion in the Southeast Coalinga field of Fresno County bears out the contention of geologists and petroleum engineers that this field will ultimately prove to be of considerable importance and probably show a maximum recovery per acre.

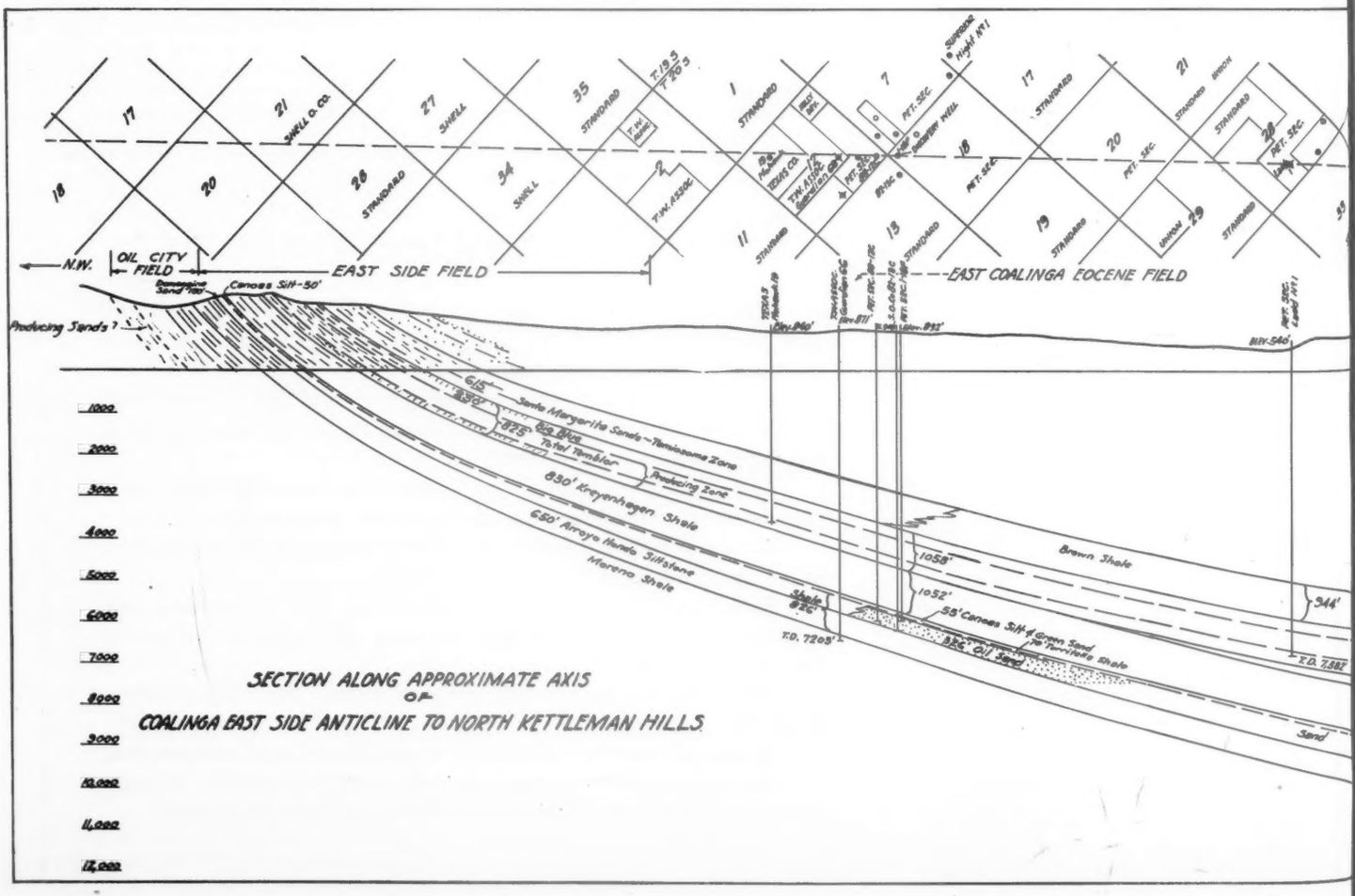
Designated by some as the Coalinga Eocene field and the Southeast Coalinga field by others, it is about 6 miles northeast of the town of Coalinga and is a major accumulation between the East Coalinga field to the northwest and the Kettleman North Dome field to the southeast. The Coalinga field, which is really two separate accumulations, is one of the oldest in the state, and has for many years been designated as the Coalinga West Side field and the Coalinga East Side field. It is the most northerly field in California from which any appreciable amount of crude is obtained. The new Southeast Coalinga field lies immediately adjacent to and southeast of the old Coalinga East Side field and is about 7 miles northwest of the Kettleman North Dome field. The Coalinga East Side field, Southeast Coalinga field, Kettleman North Dome field, Kettleman Middle Dome field, Kettleman South Dome and the Lost Hills field are structural features located along the Coalinga-Kettleman Hills major anticline.

The great plunging Coalinga anticline, which is synonymous with the Kettleman anticline, runs out into the valley in a southeasterly direction, forming at its northernmost part what is known as the Coalinga East Side field, which has contributed the largest portion of the Coalinga district production to date. Lying west of this anticline is the plunging Coalinga syncline, which runs into Pleasant Valley. A small area around the head of this syncline is productive. On the west side of Pleasant Valley, and forming the west limb of the Coalinga syncline, is the Coalinga West Side field, a monoclinal structure.

Thus we have three types of structures productive in this area; a monocline and a syncline in the Coalinga West Side field and an anticline in the Coalinga East Side field. The Kettleman Hills structure can be considered a continuation of the Coalinga anticline and it, in turn, continues into the Lost Hills field farther to the southeast. The structure of Kettleman Hills consists of a great anticline, the axis of which runs along the highest ridge in the center of the hills, with a general northwest and southeast trend and extends from the Coalinga East Side field in Fresno County to Lost Hills in Kern County.

Crude Reserve and Proved Acreage

Approximately 1,000 acres have been proved productive in the Southeast Coalinga field at present, but since the limits have not been established to the north, east, southeast or southwest, this acreage may be greatly increased. No attempt has been made since the discovery to extend the field to the southeast toward No. 1 Ladd in section 28-20-16, which Petroleum Securities drilled to 7,382 feet and suspended work before drilling No. 2 Gatchell. No. 1 Ladd, about 3 miles southeast of the discovery in the Southeast Coalinga field and close to the axis of the structure, was not carried deep enough to reach the Gatchell zone and may yet prove productive when deepened. Estimates of recovery of the Southeast Coalinga field vary from 75,000 bbls. per acre to 200,000 bbls. per acre; but those in close touch with subsurface conditions believe it will be about 100,000 bbls. per acre. Those engineers who overestimated the ultimate recovery of the Kettle-



Large Reserve

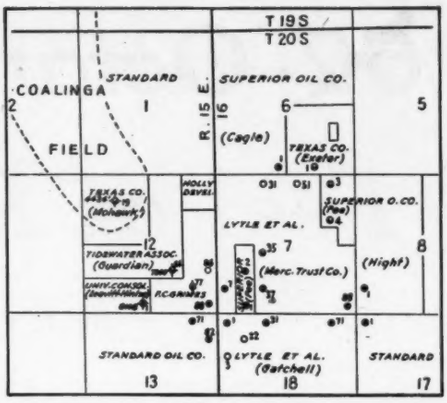
man North Dome field are not going to make the same mistake again and are very conservative with respect to Southeast Coalinga and other new fields in the San Joaquin basin. A total of 13 commercial oil wells has been completed in the Southeast Coalinga field, but, due to curtailment, operators have produced only 246,217 bbls. of crude between the discovery and December 31, 1938. Of the 13 oil wells completed, Petseahon leads with seven completions, Superior Oil Co. has four and Standard Oil Co. two. Texas Co. owns 160 acres in fee in the southeast quarter of Section 6-20-16 adjoining the Cagle lease of Superior Oil Co. and is expected to complete one or more wells in the near future. Tide Water Associated Oil Co., Texas Co. and Universal Consolidated Oil Co. found the Gatchell zone either absent or barren in Section 12-20-15. Current production of the Southeast Coalinga field approximates 3,250 bbls. per day.

On the basis of a normal expectancy of 75,000 bbls. per acre and with 1,000 acres proved productive, the Southeast Coalinga field now has in sight an expected ultimate production of 75,000,000 bbls., generally regarded as conservative in view of the porosity, saturation and permeability. The reason for the ultra conservative attitude with respect to the recovery of the Southeast Coalinga field is due primarily to the overestimation of the Kettleman North Dome field and also the apparent small volume of gas present in the new district. Estimates on Kettleman North Dome were voided because of the lack of water drive or pressure, and engineers are reluctant to estimate the Southeast Coalinga field until data is available with respect to water drive.

Topography

Topography of the Southeast Coalinga field consists of a relatively level undulating plain and might be likened to a small basin with the rims being formed by Joaquin Ridge, a range of hills on the northwest; Kreyenhagen Hills on the west and southwest, and another pronounced range in the Kettleman Hills area to the east. The elevation of three representative wells will indicate the relatively flat terrain existing between the rims. Kettleman North Dome Association No. 4-18-J in Section 18-21-17, completed in Avenal zone of Eocene age on the flat ground at the extreme west end of the Kettleman North Dome field, has an elevation of 658 feet, whereas No. 1 Ladd of Petroleum Securities in Section 28-20-16 between Kettleman North Dome field and Southeast Coalinga has an elevation of 540 feet. In the Southeast Coalinga field, Petseahon No. 88-12-C in Section 12-20-15 has an elevation of 909 feet. The properties now are being developed in Southeast Coalinga field by R. S. Lytle as operating trustee.

Drilling operations present no unusual problems and the presence of easily recognizable markers permits fast drilling. Average drilling time is between 50 and 60 days, depending upon

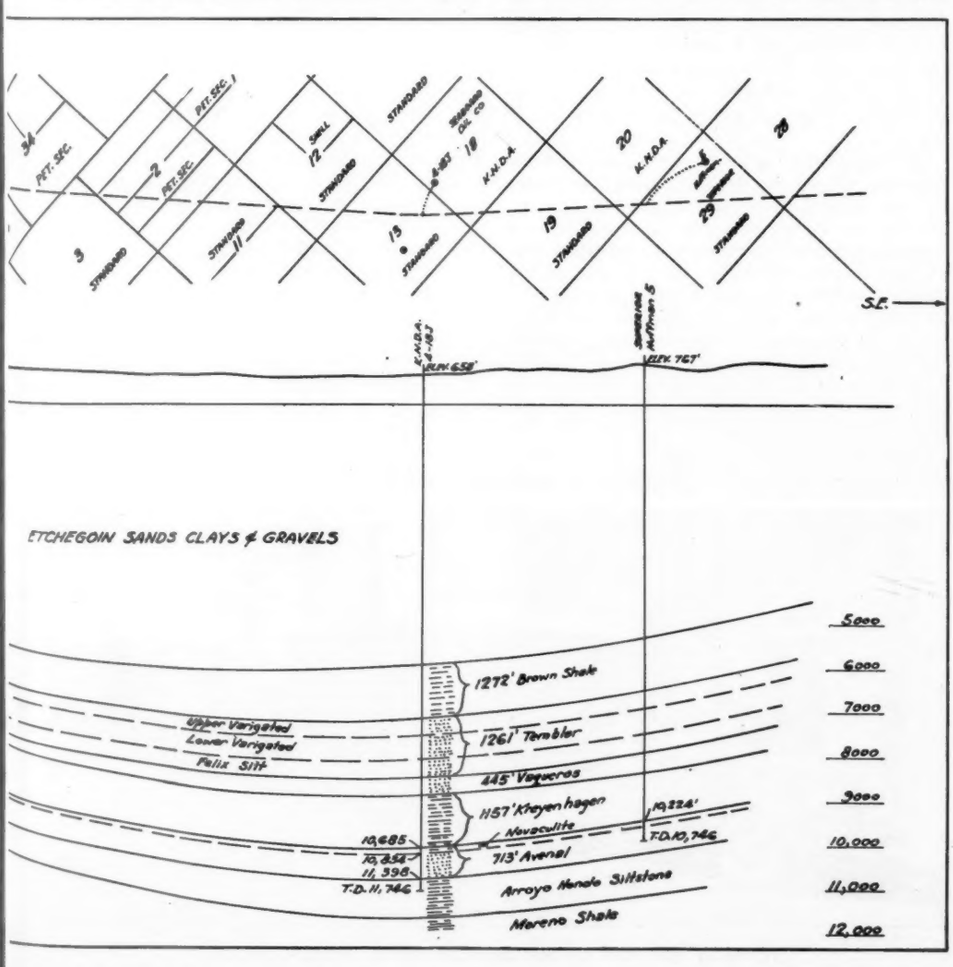


Approximately 1,000 acres have been proved up as highly productive in the Southwest Coalinga field, with the limits of production established only in one direction

depth. The drilling practice consists of landing approximately 500 feet of 13⅜-inch casing and then a 9⅝-inch water string just above the top of the productive zone. The hole is usually finished with a 6⅝-inch liner carrying 100-mesh screen and 3-inch tubing. The Gatchell or Avenal zone has an average thickness of about 400 feet, although this varies, depending upon structural location. Superior Oil Co. has cored the greatest thickness of Gatchell zone up to the present as the bit in No. 1 Cagle, the northernmost completion, in Section 6-20-16, penetrated 590 feet of oil sand. This well, which has an elevation of 708 feet, required 60 days drilling time. Top of the glauconitic sand was cored at 7,025 feet, top of the Gatchell zone at 7,110 feet and base of the Gatchell was logged at 7,701 feet. The lower 10 feet above the bottom of the hole at 7,711 feet consisted of a sandy shale which indicated the bottom of the oil zone. Petseahon No. 37-7-F in Section 7-20-16 required 50 days' drilling time and cored a total of 500 feet of Gatchell zone. This well which was bottomed at 7,401 feet, topped the Kreyenhagen at 5,778 feet, hit the top of the glauconitic sand at 6,815 feet and logged top of the Gatchell zone at 6,886 feet. Base of the Gatchell zone was found at 7,386 feet.

Trouble With Water

Water for the boilers is about the only thing that has caused any inconvenience, and this requires the exercise of extreme care by the firemen. Bell & Loffland, Inc., drilling contractors, who are drilling an outpost for Amerada Petroleum Corp. in Section 17-19-16, a few miles north of the discovery well have been experiencing trouble with water despite use of a water softener. The water, which contains a sulfate in solution, foams to such a degree that the fluctuations in the glass cause the firemen to turn gray over night. This sulfate in solution is a chemical condition and is therefore difficult to correct as it can not be precipitated out. There has been no organic deposit in the boilers. This well, No. 7-17 S. P. L., is also interesting because of the installation of a piece of equipment probably the first of its kind in California. The field presents no particular mud problem but this well is equipped with facilities that provide an almost constant check on the weight and specific gravity of drilling fluid. The fluid is introduced on the derrick floor by a small hollow tube which picks up the fluid from the trough as it comes from the well. The well is also equipped with two mud screens and two small centrifugal pumps which permit alternating use of both screens in unison or independently, as necessity demands.



67-Octane Doesn't Feel at Home Yet

By T. F. SMILEY

Although it has been more than two months since the 67-octane third-grade gasoline unexpectedly joined the family, it has not acquired the home feeling. It received a few coldly courteous nods, but suspicious looks were the rule, and even now there is no moving over to give it a seat. The warmth of the welcome extended is indicated usually by a grudging, nose-in-the-air admission that "it probably has come to stay and we might as well make the best of it."

Argument that this particular motor fuel as a substitute for the familiar third grade was not necessary to the upward progress of the octane and that it is a disturber of the peace is without interest now. It is here. And there is general agreement that it is here to stay.

First announced by the Standard Oil Co. of Indiana last December 8 in the 10 states where it is the key marketing organization, the new product has begun to appear in other areas. In the meantime refiners with retail outlets in Standard of Indiana territory have been following Indiana's lead as a matter of self-protection.

Humble Introduces Purple 67

In late January Humble Oil & Refining Co. installed a 67-octane gasoline at its own and some leased stations in San Antonio, Houston, Ingleside, and Baytown, Tex. It discontinued sale of the old third grade at company-owned stations. The new fuel, it was announced, would be available soon throughout all the company's marketing territory.

The distinguishing color of the 67-octane grade in Standard of Indiana territory, almost universally, is green. Humble's product is purple. In introducing its new product Humble said it would not compete with cheap third-grade materials. Pump prices posted for the purple are 2 cents a gallon below those for the house brand. The open tank-wagon price to dealers and consumers is 1 cent under the tank-wagon posting for the regular. No tankcar price has been posted.

Johnson Oil Refining Co., with headquarters in Chicago, is believed to be the only other company offering a 67-octane third grade outside Standard of Indiana territory. It trucks from its refinery in Cleveland, Okla., to outlets in Oklahoma and Arkansas. Available information indicates that the influence of the new material on sales of the company's other grades has been inconsequential thus far. The Johnson product is sold to jobbers at the ruling price for 63- to 66-octane fuel.

Difficulty is encountered in efforts to determine just what market effect the new third-grade gasoline has had in Indiana's territory because there is little basis yet for satisfactory comparisons. Such information as is available points to a slight falling off in sales of house-brand material and a substantial increase in sales of the new third grade compared with former sales of the old.

Standard of Indiana has issued no statement concerning the effect of departure on its own business, but inquiry in its retail territory discloses evidence that total sales of gasoline in January 1939 were larger than those in January 1938 and that the increase was mostly in sales of third grade.

One competing company which put in a 67-octane gasoline at the beginning of the current year finds that its sales of that grade were 2 per cent higher than those of the old third grade in January 1938. This was accompanied by a falling off of 1 per cent in sales of the regular and 1 per cent in sales of the premium grade. In metropolitan areas it finds no change. In small towns there was a rise of 3 per cent in third-grade sales. Two per cent came from regular-grade sales and 1 per cent from Ethyl. This company now sends none of the old third grade to its retail outlets in Standard of Indiana territory, but keeps supplies at bulk plants for farmers and others who still want it.

Third-Grade Sales Rise

Another company which installed the new fuel the first of the year reported a slight decrease in sales of its house brand during the first half of February, compared with the first half of January, and a marked rise in sales of the third grade. This company had 90 days' supply of the old third grade on hand, and as fast as this is worked off the new type is taking its place.

Service station prices in some cases bear no apparent relation to the old third-grade prices. In rural areas, where many old-model cars are still on the highways, there continues to be a substantial demand for the low-octane motor fuel. In such regions too there still is a call for the old-type fuel for lighting, heating, cooking, and for the incubator house. The higher-octane material is not adaptable for these purposes. In some metropolitan areas, where higher-compression cars predominate, service stations are reported to be getting 1 to 1½ cents more for the new product than is charged for the old. Motorists are quoted as saying the difference in automobile performance does not justify them in paying 2 cents more for the regular grade than for the 67 octane.

There is a virtually unanimous feeling that the price received for the 67-octane gasoline in Standard of Indiana territory is too low. Refiners declare the new fuel has laid upon them the necessity of sacrificing still more in a market which already was profitless. In that conviction lies a reason for the undercurrent of antagonism.

Instead of offering a 67-octane product, some independent jobbers in Indiana's territory are selling a 65-plus unleaded white material of low gum content. These jobbers are largely in agricultural regions, where consumers are glad to get a motor fuel of fairly high octane rating which can be used also for heating and lighting.

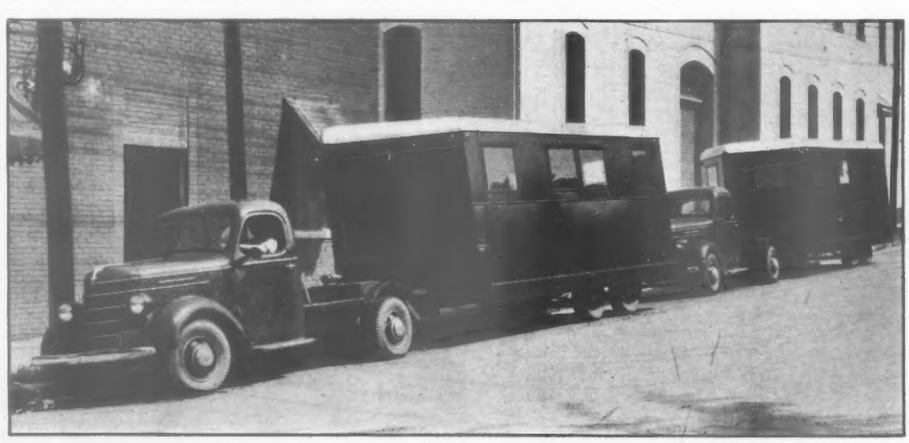
No Stabilization Yet

It was believed that introduction of a third-grade motor fuel with a definite octane rating would have a marked tendency to stabilize the gasoline market. So far it has accomplished little in that direction, though there is ground for hope that it will do so in time. The retail market in Milwaukee offers an example of the disordered market existing in many areas. In that city in December, 1938, the old "62 octane and below" was selling at the pump at 16.3 cents, including taxes. Its 67-octane successor is being sold now for 14.3 cents.

Analyses of samples of the old third-grade gasoline in that area before the advent of the 67, showed octane ratings ranging all the way from 51 to 63.5. That was a situation which invited price-cutting through sale of inferior products. It is contended that an increasing proportion of motorists will recognize the advantage of knowing definitely the antiknock classification of their gasoline and will be willing to pay more.

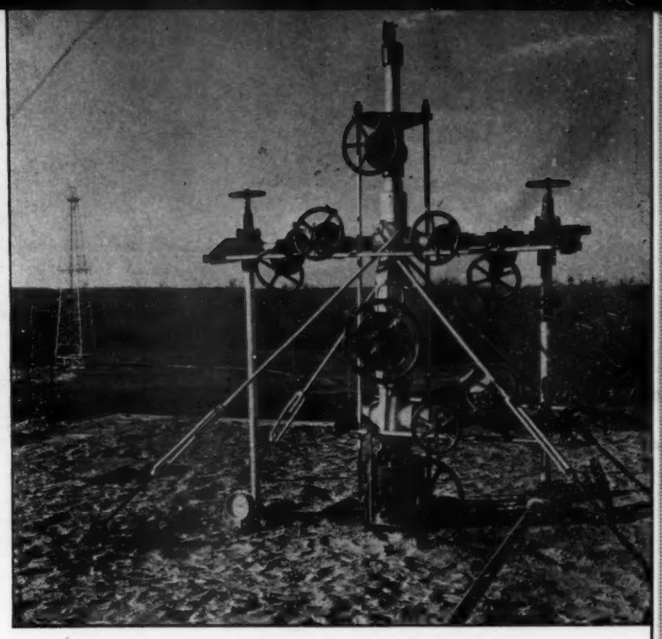
Refiners generally say it is too early to forecast with accuracy what changes in refining and marketing practice will result eventually from the movement toward higher-octane motor fuel. That the octane classifications will undergo an overhauling seems certain. Opinions vary as to what form the new classifications will take. Whether the old third grade is accorded a place in the family or not, it is agreed that a substantial demand for it will have to be taken into account. The new 67 is looked upon by some observers, not as something that started a readjustment of octane ratings, but simply as an incident in a readjustment already on its way.

Progress of the 67-octane fuel outside Standard of Indiana territory is likely to be somewhat slow and irregular. A common attitude among refiners is, "We won't make it until competition forces us to or until prices have reached a point that will enable us to sell gasoline without suffering a loss on every gallon."



Traveling gas and oil test laboratories in North Carolina

Continue Search for Lower Marine Pay in Eastern Texas



Wellhead hook-up on a large gas-distillate producer in the Opelika field of Henderson County, eastern Texas

By D. H. STORMONT

FORT WORTH, Tex., Feb. 20.—After another year of drilling in the East Texas basin in search of lower Trinity and Marine production, the area is still without any extensive oil production from these horizons. Two new gas-distillate fields were discovered in the lower Trinity as the result of several deep tests drilled, but in regard to oil production deeper drilling yielded only negative results.

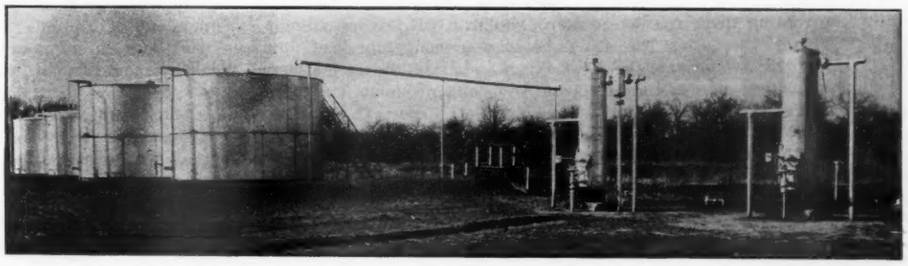
While the lower Trinity and Marine members are yet too sparsely explored in the East Texas basin to discount them as a major source of oil in the future, its present status of development tends to limit it to a large gas-distillate reserve. Only two tests at present are drilling with the lower Trinity or Marine as their immediate objective, but plans for several such tests are under way and are to be started in the near future.

Search for Woodbine production during the past year also was none too successful, and since this pay has been explored much more widely than the deeper horizons some geologists are beginning to believe the brightest hope for new production in eastern Texas lies in the lower Trinity and Marine. In this area, to date only some 24 tests have been drilled to the Travis Peak, lowest member of the Trinity group, four have been drilled into the lower Marine and only two have tested the Reynolds lime or other beds underlying the lower Marine series.

Since the lower Trinity series is productive at Rodessa in the Ark-La-Tex region, at Jefferson in Marion County, Texas, and other points in southern Arkansas and northern Louisiana, it is expected much of the future drilling in this area will be to test these horizons. Search for Paluxy pay, top formation of the Trinity group, is also expected to increase, based on its performance to the north in the Talco and Sulphur Bluff fields. Also, the success of Permian lime tests in southern Arkansas has resulted in the working-over of several known structures in northeast Texas with the view of testing this horizon.

Several structures in the East Texas area are rated as good deep oil prospects, despite disappointments in some instances. Among these are the Mexia fault series, the Kelsey dome of Upshur County, the Corsicana fault series, the La Rue dome in Henderson County and possibly deeper pays in the Talco, Sulphur Bluff and other fields producing from the upper Trinity or Woodbine. The Kelsey dome structure, believed to have at least 700 feet of closure, is rated as an attractive prospect despite the abandonment of several shallow tests and one test in the Travis Peak. The Thornton fault of the Mexia series also is highly rated due to its great closure.

In Limestone County along the Mexia fault series, six tests have been drilled to the Travis Peak and of these two drilled into the Reynolds lime or through it. First lower Trinity test in this area was drilled by E. L. Smith Oil Co. and others on the J. Steubenrauch tract in 1937. Hole was carried to 5,732 feet where a large volume of gas was encountered, but in running casing for a production test the hole was junked and never completed. Pure Oil Co. early in 1938 abandoned a test (No. 16-T Kendrick in the P. Varella Survey) in the Reynolds lime after finding no production in the lower Glen Rose, Travis Peak or lower Marine. The test topped the Travis Peak at 5,656 feet, the lower Marine at 7,675 feet and the Reynolds lime at 8,763 feet. Carried to a depth of 8,847 feet, hole was abandoned when the drill pipe stuck.



Low-pressure separators and tank battery on a Cayuga field lease, East Central Texas

Deepest test in this immediate area was abandoned by Stanolind Oil & Gas Co. and Ramsey Petroleum Corp. in March of last year. This test, No. 1 T. Norris, on the Thornton fault structure, topped the Pettet at 5,375 feet, Travis Peak at 5,528 feet, the lower Marine at 7,595 feet and Reynolds lime at 8,525 feet. Bottom of the Reynolds lime was placed at 8,995 feet, after which salt beds, anhydrite and conglomerate were encountered in drilling to the total depth of 9,951 feet. Only minor shows of oil and gas were found in the lower Trinity and Marine sections, so that failure of this test was a decided setback for prospects in that area.

At Kelsey dome in Upshur County, Tom Hunter and American Liberty Oil Co. carried a deep test to the Travis Peak without finding any favorable showings or reaching its lower Marine objective. This test, No. 1 J. P. Carter, topped the lower Glen Rose at 6,826 feet, Pettet at 7,045 feet, the Travis Peak series at 7,525 feet and was abandoned at 9,538 feet without drilling out of the Travis Peak.

In Panola County, east of the East Texas basin, Magnolia Petroleum Co. last year discovered showings of oil and gas in a lower Marine sand. In running casing for a production test, however, the hole was junked and the well plugged back to the lower Glen Rose where it was completed as a gas-distillate well. The test, No. 1 E. A. Hull, near Carthage, topped the lower Glen Rose at 4,875 feet, Travis Peak at 6,024 feet, lower Marine at 8,075 feet and at its total depth of 8,718 feet was still in the Marine. Showings of oil and gas were called at 8,668-8,720 feet, elevation 222 feet.

In the Jarvis area of Anderson County, Humble Oil & Refining Co. abandoned a projected Marine test (No. 1-C Southern Pine) without drilling out of the Travis Peak at a total depth of 9,155 feet. The Paluxy was topped at 6,080 feet, Glen Rose at 6,300 feet, anhydrite stringer at 7,400 feet, massive anhydrite at 7,615 feet and top of the Travis Peak at 8,895 feet.

A test drilled by H. L. Hunt and others in Smith County furnished the first information on deeper pays in the area immediately to the west of the East Texas field. Their No. 1 Bradley in the Chapell Hill area was drilled to a total depth of 7,528 feet in the lower Trinity and then plugged back to 7,325 feet where it was completed for a gas-distillate producer.

On the eastern side of the field, near Longview in Gregg County, Humble Oil & Refining Co. and Gulf Oil Corp. developed the most promising discovery uncovered in this area. Their No. 1 Robertson in the M. Mann Survey was carried to a depth of 10,284 feet, the deepest test drilled in East Texas. The test, with an elevation of 272 feet, topped the Paluxy at 4,541 feet, upper Glen Rose at 4,876 feet, first anhydrite at 5,617 feet, top of the Glen Rose anhydrite at 6,214 feet, lower Glen Rose at 6,532 feet, top of Travis Peak at 7,325 feet and into the lower Marine at 9,410 feet. The test was then carried to 10,284 feet in search of Reynolds lime production, but when the test started plugging back hole was still in the lower Marine series. After testing shows encountered in the

(Continued on Page 52)

F. B. Ely, Rockwood Associates, New York, and W. P. Haynes, geologist, foreign producing department, Standard Oil Co. of New Jersey

Seek Basis For Adjustment at

By H. STANLEY NORMAN

NEW YORK, Feb. 21.—Modification of proration as it has been practiced, placing allowables strictly on a basis of "optimum production"—that is, at levels eliminating waste and utilizing inherent reservoir energy to the fullest—was championed as a practical necessity at the annual meeting of the American Institute of Mining and Metallurgical Engineers, Petroleum Division, which engaged the attention of engineers, geologists, geophysicists, economists, producers and government officials from February 13 to 16. In many different ways the engineers, economists and others participating in the meeting declared unnecessary drilling has undermined the proration system which serves the dual purpose of preventing physical waste and restricting supply to somewhere near market demand.

Geis, New Chairman

W. H. Geis, special representative of Union Oil Co. of California, Los Angeles, Calif., took office as the new chairman of the Petroleum Division.

One of the meeting's highlights was the address following the annual Petroleum Division dinner by Harry C. Wiess, president of Humble Oil & Refining Co., Houston, Tex. Mr. Wiess reviewed the history of proration and cited the factors placing a premium on unnecessary drilling as the gravest problem now confronting the oil industry.

Removal of the incentive to drill more wells than necessary is the immediate need of the oil industry, as shown by an analysis of the papers and discussions presented at the sessions. The purely scientific engineering phases of the industry were treated in various meetings during the week, but topics of this nature were subordinated to the proration problem because of the fundamental modifications required.

Consideration of the producing practice in this country proved timely. On the day the proration practice issue occupied the spotlight in the Petroleum Division's economic symposium, President Roosevelt was delivering a message to Congress calling for consideration of legislation for conservation of natural energy resources, specifically mentioning oil along with coal, natural gas and water power.

Energy resources are not inexhaustible, yet the nation permits waste in use and production, the president wrote, and apparent economies today mean in some instances that future generations will carry a burden of unnecessarily high costs, and be forced to substitute inferior fuels. The time had come, the president said, to devise a policy treating the energy resources as a whole, rather than individually. Since it could not be done overnight, it was necessary to recognize that each had a bearing on and affected the others.

The meeting was particularly free of warnings of real or threatened calamity, but as several speakers at the dinner Thursday night pointed out, the discussions about production practices and failure to solve the problem have turned to a cold analysis of the situation in search of methodical solutions. This transition was considered by practically all the leaders as evidence the industry will solve its own problems without sacrifice of the freedom from restraint now enjoyed.

The A.I.M.E. Petroleum Division program was divided into three parts. Tuesday was devoted to production engineering in foreign fields. "Economic Aspects of Oil Field Exploration in Colombia," delivered by E. Ospina Racines, first vice consul of Colombia in charge of petroleum affairs in New York, related his observations on an airplane trip in his country late last year. It was featured by a movie which included a flight over the South American Gulf Co.'s pipe line route from the Barco Concession to Covenas.

Vernon Taylor, Imperial Oil Co., Ltd., Toronto, reviewed geological and development conditions in Turner Valley, emphasizing the complexity of the structure. The treatment of coal with petroleum to render it dustless was discussed by J. M. Pilcher and Ralph A. Sherman of Batelle Memorial Institute. The engineering session was presided over by Benjamin C. Craft and M. L. Haider.

The second day was devoted to foreign and domestic production, J. Terry Duce, Texas Co., and W. B. Heroy, Pilgrim Oil Co., presiding.

The economics session occupying all of Thursday, the final day, was one of the best attended of the Petroleum Division's program. The feature was the address by Col. Ernest O. Thompson, chairman of the Interstate Oil Compact Commission and a member of the Texas Railroad Commission. Col. Thompson reiterated his previously expressed criticism of the refining branch of the industry saying it was the only loose end of the business and that it was running wild. His subtle observation that he understood some of the refining companies were headed by the same men as headed large producing units inspired applause. Later, at the annual banquet Colonel Thompson said he was highly impressed by the careful study of producing practices and the methodical approach to a solution for existing ills. He said he felt confident if the general public could understand how seriously the industry is seeking to terminate wasteful practices sympathy and encouragement would be forthcoming from the entire nation.

Rule of Capture

Earl Oliver of Ponca City, Okla., was unable to attend this year's meeting, but his long activity in the A.I.M.E. Petroleum Division, particularly in production economics, was continued by a prepared statement commending Joseph E. Pogue on his paper, "A Design for More Effective Proration," published in The Oil and Gas Journal of February 16. Mr. Oliver again pointed to the rule of capture as one of the basic causes of excessive drilling. Mr. Oliver's statement was read by Sidney Swensrud, Atlantic Refining Co., Philadelphia, Pa.

An address on "Some Current Problems in Oil Conservation" by Mr. Wiess featured the annual dinner. George B. Corless, Houston, Tex., superintendent of Humble Oil & Refining Co. Gulf Coast division, relinquished the chair which he held as chairman of the Petroleum Division in 1938 to Dr. Joseph E. Pogue, vice president, Chase National Bank, who introduced Mr. Wiess.

Among the speakers called upon for informal remarks were Alexander Sachs, New York econ-

W. H. Geis, Union Oil Co. of California, new chairman of the A.I.M.E. Petroleum Division, receiving friendly suggestions from George B. Corless, superintendent of Humble Oil & Refining Co., Gulf Coast division, retiring chairman

Proration at A.I.M.E.

W. B. Heroy, vice president, Pilgrim Oil Co., Houston, Tex., member of the executive committee, and J. Terry Duce, Texas Co., New York, vice chairman for production, congratulated Ralph J. Schilthuis, center, research department, Humble Oil & Refining Co., Houston, Tex., upon his receiving the Alfred Noble prize for his paper on "Connate Water in Oil and Gas Sands"

omist; W. R. Boyd, Jr., executive vice president, American Petroleum Institute; E. DeGolyer, Houston, Tex., independent; Dr. George Otis Smith, Washington, D. C., former director of the U. S. Geological Survey; Winthrop Rockefeller, and Norman D. Fitz Gerald, both of Chase National Bank, and W. B. Heroy.

D. C. Jackling, retiring president of the general institute, attended the Petroleum Division dinner and recalled some of the pleasures of his annual tour to the oil country.

Most of the papers presented in the Mining Geology division of the institute and in joint sessions with the committee on Geophysical Methods of Exploration dealt specifically with problems in the mineral mining industry.

Other new officers of the Petroleum Division were announced, or introduced by Mr. Corless at the annual dinner. They follow: T. V. Moore, Humble Oil & Refining Co., Houston, Tex., associate chairman; Benjamin C. Craft, professor of petroleum engineering, Louisiana State University, secretary and treasurer.

Executive committee: George B. Corless; S. M. Greenidge, Texas Pacific Coal & Oil Co., Fort Worth, Tex.; W. B. Heroy; E. A. Stephenson, professor of petroleum engineering, University of Kansas, Lawrence, Kans., and Paul Weaver, Gulf Oil Corp., Houston, Tex.

Production engineering chairmen and vice chairmen: F. B. Plummer, University of Texas, petroleum engineering department; K. A. Covell, Pure Oil Co., Tulsa; W. S. Morris, East Texas Engineering Association; E. L. Porch, Jr., consulting engineer, San Antonio, Tex., and F. G. Tickell, professor of petroleum engineering at Stanford University.

Mr. Duce was elected vice chairman of the Division for Production; D. L. Katz, University of Michigan, Ann Arbor, Mich., vice chairman for engineering research; L. F. Terry, Chase National Bank, New York, vice chairman for economics and Walter Miller, Continental Oil Co., Ponca City, Okla., vice chairman for refinery engineering.

Van Covern's Estimates

Particular attention was given to the paper on Motor Fuel and Crude Oil Supply and Demand by Fred Van Covern, director, Department of Statistics, A.P.I., from which the following extracts are taken:

Recognizing the existence of considerable difference of opinion as to economic trends during 1939, and agreeing that no one can definitely foresee actual future conditions, I think the domestic demand for motor fuel during this year will approximate 541,000,000 bbls.

While not unmindful of the uncertainties involved, I am firmer than ever of the opinion that this year's foreign shipments will not decrease very much from the 1938 level, and, in my estimates, have placed them at 48,000,000 bbls.

Combining these two figures, I arrive at a total shipment of motor fuel during 1939 of 589,000,000 bbls., or approximately 3.0 per cent greater than the total shipments during 1938.

It is my opinion that economically desirable levels of finished and unfinished gasoline inventories at the end of the first quarter of this year are not greater than 80,000,000 bbls.

Should the actual inventory position on March 31 next show a total of 86,000,000 bbls. of finished and unfinished gasoline in storage, the industry, in a sense, will have borrowed the manufacture of perhaps 6,000,000 bbls. of gasoline from the required production of that product during the second and third quarters, if it is to enter the next season of low demand with no surplus gasoline in storage.

Minimum economic requirements of crude oil inventories aboveground at this time and under present conditions of supply and demand are not higher than 225,000,000 bbls. as compared with actual inventories on January 28, of 271,763,000 bbls.

Second and Third Quarters of 1939

It is estimated that 61,000,000 bbls. represented the economic minimum necessary at the end of the 1939 summer season, if no surplus gasoline is to be carried into next winter.

ACTUAL INVENTORIES, FINISHED AND UNFINISHED GASOLINE

(Barrels of 42 gallons)

	March 31	September 30	Liquidation
1936	74,485,000	57,800,000	16,685,000
1937	81,651,000	65,380,000	16,271,000
1938	92,320,000	69,086,000	23,234,000
	Estimated actual	Estimated economic	
1939	86,000,000	61,000,000	25,000,000

SUPPLY AND DEMAND, GASOLINE AND CRUDE OIL, APRIL-SEPTEMBER 1939

(Barrels of 42 gallons)

	Second quarter 1939	Third quarter 1939
Total motor fuel demand	153,300,000	163,600,000
Benzol and natural direct	3,090,000	3,090,000
Demand for refinery gasoline	150,210,000	160,510,000
Finished gasoline stocks:		
Beginning of period	79,500,000	70,360,000
End of period	70,360,000	56,000,000
Change during period	—9,140,000	—14,360,000
Natural gasoline blended	8,690,000	10,070,000
Production finished gasoline	132,380,000	136,080,000
Beginning of period	6,500,000	5,800,000
End of period	5,800,000	5,000,000
Change during period	—700,000	—800,000
Production finished and unfinished from crude	131,680,000	135,280,000
Percentage yield from crude	44.5	45.5
Crude oil runs to stills	295,910,000	297,320,000
Daily average	3,252,000	3,232,000
Requirements domestic crude oil daily	3,482,000	3,462,000
Withdrawals of crude oil daily	50,000	50,000
Required crude oil production daily	3,432,000	3,412,000
Actual crude oil production daily, 1938	3,248,900	3,344,800

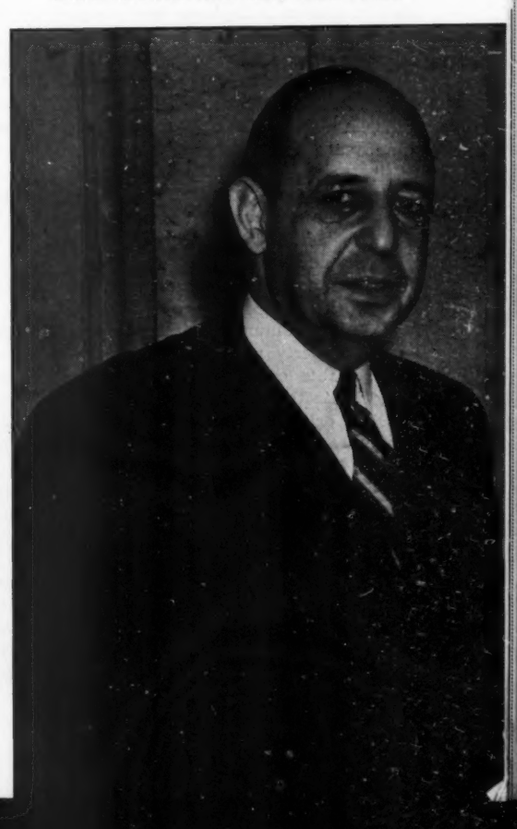
It will be seen from the foregoing figures that the presently apparent requirements of newly produced crude oil in the second and third quarters of 1939 are, on the basis of calculation indicated, about 180,000 and 70,000 bbls. respectively, greater than in the corresponding three-months' periods of 1938.

CRUDE-OIL PRODUCTION 1938 vs. 1939 REQUIREMENTS

(Barrels of 42 gallons)

	Daily averages — Second quarter	Third quarter
Apparent required crude oil production, 1939	3,432,000	3,412,000
Actual crude oil production, 1938	3,248,900	3,344,800
Increase in daily average	183,100	67,200

W. A. SINSHEIMER
Cities Service Oil Co., New York



Some Current Problems in Oil Conservation

By H. C. WIESS
President, Humble Oil & Refining Co., Houston, Tex.

A.I.M.E. — Extracted from paper presented at annual meeting, New York

Certain principles of conservation have been reasonably well demonstrated, and are fairly well accepted in general by the industry and the conservation agencies of the states engaged in the conservation program.

1. Maximum recoveries are secured from an oil reserve and at lower cost when the reserve is produced at such rate and under such methods as will conserve and utilize effectively the natural reservoir energy.

2. While fields of differing characteristics are capable of producing their reserves at varying optimum (with minimum waste) rates, our study and experience indicate that in general a developed field will yield maximum oil recoveries when its reserve is depleted evenly over a period of not less than 20 to 30 years.

3. Regardless of the optimum rate of production in a field from an engineering standpoint, the production at rates in excess of market requirements leads to waste above and underground; and production must, therefore, be limited to market demand even though the field might otherwise produce at a somewhat higher rate with efficient use of the reservoir energy.

4. In general, if the optimum rate for a field is lower than the demand, it should establish the rate of production; if demand is lower, it should establish the rate.

5. Both maximum recoveries and the protection of property rights require a uniform and equitable rate of withdrawal from the several properties in the field.

6. The drilling of more wells in a field than are required to recover the reserves and meet the demand for oil therefrom at efficient rates of production constitutes excessive drilling, unnecessarily piles up capital investment in the producing end of the business, and of itself leads to physical waste.

It is observed that these six principles deal for the most part with some technical phase of the conservation effort, and flow generally from the fundamental reasoning that we are justified in seeking the maximum recovery from our oil reserves. If these principles were not supported by even broader considerations, we could not expect to maintain them in practice. Indeed, if they are to be maintained, they must be in complete accord with the public interest. To satisfy this requirement we must operate our oil business not only so as to assure a supply adequate to meet the national demand over an indefinite period, but also to provide the supply at the lowest practicable cost. Based upon study and experience I believe that these principles satisfy such requirements, and if carried into effect will satisfactorily serve both the public interest and the industry's interest, which after all are essentially the same.

Toward the end of 1937 a lethargic industry began to feel the pinch of declining prices and recognized the impending harm which would inevitably follow if excessive drilling and the piling up of stocks of crude and products were not brought to an end.

Let us consider the effect on our business of the rate at which drilling operations have been carried on, and the consequences of an overproduction of crude in certain areas, which has been accompanied by a disproportionate participation in the market for crude by such areas, and attempt to ascertain what influence these factors have had in bringing about the current dual condition of instability and waste.

The rapidly increasing number of wells has made necessary continued reductions in the allowable per well in order to hold the state production within the limitations of demand. The decline in income per well thus brought about lengthens the time of pay-out, which often results in strong economic pressure to produce in excess of market requirements, and in closely drilled areas sometimes builds up field allowables to amounts which exceed efficient rates of production for the field as a whole, bringing about physical waste. Such practices also involve economic waste through tying up capital unnecessarily and bring instability to the industry.

For a number of years the soundness of the principle of wide well-spacing has been recognized by many operators, and notwithstanding the great number of wells drilled, there has been a tendency toward wider spacing. Figures show that whereas prior to 1929 only 7 per cent of the Texas fields were drilled on 20 to 30-acre spacing, during the last 10 years more than 25 per cent of the fields have been drilled on this basis. Likewise, whereas prior to 1929 only 3½ per cent were drilled to a spacing of 40 acres and above, during the last 10 years more than 14 per cent have been drilled on this spacing. Despite this tendency, however, drilling of unnecessary wells has continued in many important areas with the results set forth above.

Unnecessary Drilling

One naturally asks the question why unnecessary drilling continues in the face of decreasing well allowables and constant lengthening of pay-outs. We think the answer lies primarily in the fact that in nearly all the states, in the allocation of allowables between properties, too great emphasis is given to wells as such, or to the potential production from wells, and too little emphasis to the quantity of recoverable oil underlying the properties being drilled. So long as a well secures its allowable on this basis, and its drilling is profitable, the tendency is to multiply the number of wells. If an operator knew that when he drilled an unnecessary well he would not increase his production, unnecessary drilling would stop. The advantage gained by any operator who drills an unnecessary well tends to cause the adjoining operator to drill unnecessary wells on his property in an attempt to protect himself. In this way there is a tendency, in the absence of a spacing rule enforced without exceptions, for greatly excessive numbers of wells to be drilled in many fields. This was the occasion for the close drilling of the East Texas field and numerous other fields in Texas and elsewhere. The industry and the conservation bodies can contribute to the solution of this problem by basing the allocation of production or allowables between properties in some fair and substantial relation to their respective recoverable oil reserves. When this is done the operators will drill only such number of wells as are necessary to produce their own oil in an efficient manner. The problem of unnecessary drilling is an acute one, and must be dealt with seriously and promptly. It behooves the entire industry, the banking interests, and the regulatory authorities of the various states to take stock of the situation and to

(Continued on Page 170)

H. C. Wiess presents executive's viewpoint

AN ADMINISTRATOR'S VIEWS ON PRORATION

By Ernest O. Thompson

Chairman, Interstate Oil Compact Commission, Member Railroad Commission of Texas

Col. E. O. Thompson speaks as administrator

You are all aware that the per well revenues are steadily being reduced and that if this trend continues there will come a time when it will no longer pay to drill new wells. The purpose of this talk is to emphasize that we are now at that point. We have drilled too many wells. More wells do not make more markets. It would be all right to drill if we could sell the oil. But only so much can be sold.

I have a table giving the figures for the State of Texas for the years 1937 and 1938, and have estimated 1939.

	Total revenue	Total barrels	No. of wells	Per well allowable	Price	Per well revenue
1937	$594,500,000	510,318,000	77,360	19.4	$1.16	$7,685
1938	514,800,000	468,000,000	85,387	15.0	1.10	6,029
1939	465,600,000	480,000,000	91,400	14.4	.97	5,094

This is a picture of a steady shrinkage in the total revenues of the oil producers of Texas and a still more rapid decline in the per well revenue.

The average per well cost, including lease equipment, is around $25,000. From the $5,094 must be deducted the one-eighth royalty, together with all operating costs, including taxes. If one should subtract a 5 per cent interest charge, the balance, if continued, will pay the well out between 10 and 15 years. However, the increase in wells in 1940 and 1941, if we do not go to wider spacing, will almost certainly exceed the growth of any market that we can now expect, and one must either assume an increase in price or accept the fact that the per well revenue will drop again in 1940 and still further in 1941. A very slender margin is left in 1939 for capital return. By 1941 this may very easily have disappeared unless wider spacing is adopted.

What I am saying is—bluntly—that the oil business is putting too much money into the ground—drilling too many oil wells. Production loans are proper if they represent the use of capital in an enterprise from which the money will be returned with reasonable interest. As production, through proration, became more stable the volume of such loans increased. Then came the depression, and good production loans, reducing each month, proved to be the best paper in the banks.

This history has built up what is now almost a tradition: That oil paper is safe. The trouble with a tradition is that it continues long after the fact basis that created it has disappeared.

I believe the oil industry should be regulated to the extent necessary to prevent physical waste and that whenever, in the prevention of waste, it is necessary to limit production, the production should, as an incident to fair play, be prorated. Regulations should not go beyond this.

The effect of such a policy is to protect the public in its right to the nonwasteful economical production and use of a natural resource. Subject to this it permits the industry the greatest possible degree of freedom consistent with fair competition. Petroleum is one of our major activities. It will continue to make money but the indications are that profits will not be as easy as in the past. Only those operators of more than average competence will succeed. This is but the common experience of business. It cannot be avoided by the use of proration so as to create scarcity and artificial prices.

The pressure chart of the East Texas field shows clearly that there is a direct relationship between the rate of flow and bottom-hole pressure. Each time we reduced the rate of flow we were able to check the decline of bottom-hole pressure.

If the production rate of 90,000 bbls. daily (which prevailed from March 10 to July 12, 1933) had been allowed to continue, the average reservoir pressure of the East Texas field would have declined to 760 pounds per square inch during July, 1934, and the accumulative production at that time would have been 695,000,000 bbls.

Waste Avoided

It is now generally well understood that when the gas is allowed to evolve out of solution the viscosity of the oil is increased and the effectiveness of the water flood is decreased as much as 75 per cent, and in as much as only 695,000,000 bbls. would have been produced at that date out of an estimated ultimate recovery of approximately 4,000,000,000 bbls., it is obvious that a tremendous waste of crude oil would have occurred in the East Texas field.

Since the total withdrawal from the field was regulated, however, the bottom-hole pressure decline was arrested with the result that approximately 1,400,000,000 bbls. of oil have been withdrawn from this reservoir, the average pressure as of Janurary, 1939, is still approximately 1,107 pounds per square inch, and roughly, 19,600 of the 25,600 wells are still flowing.

We have recently made tests of carefully taken cores on the west side of the East Texas field, where oil is no longer produced. These cores had less than 3 per cent of oil saturation remaining in the sand. It indicated that under this method of operation there is remarkably high recovery.

This field is eight years old. It has produced 1,400,000,000 bbls. of oil. The predictions are rather uniform that 2,500,000,000 bbls. more will be produced. Most engineers estimate that the conservation efforts of the State of Texas have added 2,000,000,000 bbls. to the ultimate recovery. Possibly $300,000,000 in lifting costs have been saved.

In East Texas we now know how much oil may be withdrawn without physical waste and the allowable is set at that figure. It is not based on the market demand and fluctuations in the market demand do not affect it. It is pure conservation. It is simply the preservation of bottom-hole pressure.

I am wondering if our experience in the East Texas field may not suggest the answers to this whole conservation proration problem.

If the optimum rate of flow could, by similar careful analysis, be determined for every oil pool in the United States, and the production held to that there might, as between the states, be no proration problem. It is quite possible that if all the oil in the United States were produced without waste the total production would not exceed the needs of the market. The only proration would then be between the producers within a field.

The entire industry understands the disasters that will follow if proration should be entirely abandoned.

The first trouble is in the arrangement between the states. As you know, not all of the producing states are members of the interstate oil compact. The members use as a basis for allocation the market forecasts of the Bureau of Mines. The bureau has done a magnificent job in the over-all forecast.

The figure which the bureau uses in determining the market demand of a state is the past movement of the crude from that state. When a state, in a stern effort to bring stability, cuts its own permissible allowable the figures of the bureau soon reflect that cut, and the open areas gain in their estimated requirements. The bureau, of course, takes the facts as it finds them.

A fairer method would be to base the allowables on the developed reserves, conditioned, of

(Continued on Page 163)

A.I.M.E. **— Extracted from paper presented at annual meeting, New York**

A.I.M.E. Abstracts of Papers at Annual Meeting

PRINCIPLES OF WELL SPACING

By Morris Muskat
Gulf Research & Development Co., Pittsburgh, Pa.

Field studies of the well-spacing problem in which the ultimate recoveries from different fields with different well spacings have been compared. The comparisons have generally suffered from the lack of knowledge as to the similarity of the inherent characteristics of the producing reservoirs being compared such as the sand volumes, the sand porosities, the sand permeabilities, the original reservoir pressures, the presence or absence of gas caps, the presence or absence of effective water drives and finally the economic limits of production rates at which the various fields were considered to have yielded their ultimate recoveries. The physical principles underlying the problem of well spacing are developed in the paper. On the basis of the experimentally determined laws governing the flow of gas-liquid mixtures through sands it is shown that the physical ultimate liquid recoveries—after the pressures have fallen to atmospheric throughout the whole reservoir—will be independent of the well spacing. The economic phase of the problem is then introduced by defining the economic ultimate recoveries as those derived before the individual well production rate falls to a preassigned unprofitable minimum.

These economic recoveries are computed under simplifying assumptions for the special case of a linear column of sand, such as "shoestring" sand, cut at equally spaced intervals by the producing "wells." It is found that for this special system the economic ultimate recoveries will increase with the number of wells, although the gain to be derived from any additional well decreases as the number already present increases. This falling off in the contribution to the total economic ultimate recoveries from the additional wells is most marked for highly permeable sands producing oils of low viscosity and for low minimal per well production rates for profitable operation.

Regardless of other factors, the low-pressure part of a reservoir is bound to receive certain portions of oil and gas from neighboring properties. It follows that a densely-drilled property will remove more oil than the sparsely drilled.

From a strictly physical point of view, the question of well spacing does not really exist. It appears that under similar conditions of production the total amount of oil that can be displaced from a sand filled with a liquid that is saturated with gas to a given pressure is entirely independent of the number of wells that are used to withdraw that oil. This conclusion is of only academic interest.

MUD TECHNIQUE IN IRAN

By M. W. Strong
Anglo-Iranian Oil Co., Iran

A mud laboratory is now part of the essential establishment of a modern oil field and to it current problems can be submitted for the most thorough investigation. In this paper the main mud problems in Iran are discussed, some of which are peculiar to local conditions.

The main problems we have to face are:

1. High-pressure shows, necessitating very heavy muds.

2. Porous or permeable formations, necessitating the use of bentonite to stop mud-ringing.

3. Caving formation, due either to tectonic causes, as in heavily fractured zones, to beds plastic under high rock pressure, or to beds taking up water from the mud and sloughing into the hole.

4. Highly fissured formations, causing lost circulation and necessitating special temporary measures.

The pure mud problems, which have to be solved in connection with the above, are:

1. The highest gravity in muds usable under given conditions.

2. The least permeable or nonmud-ringing muds obtainable, fulfilling also other necessary requirements.

3. The most satisfactory setting or sealing mixtures.

As a weighting material barite is used mixed with a water-bentonite base. If the strata to be drilled contain neither salt nor salt water, a 1.05 bentonite is usually of sufficient strength, but if brine conditions have to be met, the bentonite is preferably hydrated as much as possible by pumping through high-pressure nozzles with fresh water before introducing the brine. In this way much greater suspension efficiency is obtained from the bentonite.

Where no fresh water is available, the bentonite may have to be mixed in concentrations approaching 9 pounds per cubic foot. This is admittedly rather inefficient, but improved methods are being studied.

When muds of 2.5-gravity or over are needed, magnesium chloride saturated brine is used as a base, so as to reduce the viscosity.

For moderate muds, lime marl is useful in small concentrations as a suspending agent, owing to certain reactions between it and the $MgCl_2$, which impart a slimy lubricating property to the grains and also counteract to some extent excessive settling or packing.

The highest gravity of muds we have been called upon to pump down wells was 2.76, which went down 6,000 feet of 4-inch drill pipe without trouble.

When drilling into beds with high-pressure shows, we find it convenient to do so with a bottom-hole excess differential pressure not exceeding 100 pounds per square inch. If there is good connection, subsequent production is not usually difficult.

Lost circulation is a fairly common happening in our fissured limestones.

In normal conditions where the fissures are not large an effective method is to pump down thick mud full of cuttings.

In more stubborn cases mud and cement mixtures are used with effect, the mix being as thick as possible.

ECONOMIC EQUILIBRIUM IN PETROLEUM REFINING

By Norman D. Fitz Gerald
Chase National Bank

There is a persistent lag of from three to six months in the conformity of the total demand for petroleum products with industrial production.

There is a persistent lag of from 12 to 15 months in the conformity of inventories of petroleum products with industrial production.

It appears that inventories of petroleum products of any particular month reflect the influences of total demand of the twelfth preceding month, the level of industrial production of the twelfth preceding month, and the current volume of crude oil in storage.

The rate of supply of each product reflects the influences of demand, price, and inventory.

Inventories of each product exert a positive influence upon the rate of supply instead of exerting a negative or normalizing tendency. Therefore, price is required to fulfill not only its conventional economic functions but also that of overcoming the tendency of inventories to induce additional supplies.

The joint nature of the supply of petroleum products causes any abnormalities in the supply-inducing factors to be transmitted from one product to another, rather than be counteracted.

Recent shifts in the importance of the supply-inducing factors have been favorable in character. The total motivation of demand has declined slightly and there has been a moderate drop in the momentum associated with inventories while these changes have been counterbalanced by a substantial rise in the part played by the functioning of price. Although the ascendancy of price is not necessarily sound, the decline in the disequilibrating momentum associated with the inventories of each of the three products is an encouraging development. This impetus to store a product when the demand has decreased and, conversely, to withdraw from storage when the demand has increased rather than shift yields between products to maintain internal balance, has been a source of trouble to the industry by accentuating the departures from cnnditions of equipoise. Gasoline and residual fuel-oil supplies have both become more responsive to price, while the effects of demand and inventory momentum are slightly less. The supply of gas and distillate oil has become more sensitive to demand and less subject to price and inventory momentum. This change is indicative of the increasing willingness of refiners to adjust operations to produce more gas and distillate oil without the added incentive of a higher price

Despite the fact that the oil industry has one of the best and most complete statistical registers among our major industries, it appears to give little attention to the management of inventories of products until the problem becomes acute and important price changer have been induced. This difficulty could be mitigated if the current supply of products were adjusted to the near future level of demand, rather than to shipments of the recent past. Then the lag in the adjustment of inventories to demand would be reduced and swings in prices minimized by the maintenance of a better over-all balance. Experience in the petroleum industry, in common with most industries, has shown that inventories of products are generally accumulated at rising or high prices and liquidated at declining or low prices, accentuating the swings in prices. Speculation in petroleum inventories has imposed a heavy cost upon the industry because it is so difficult to effect reductions, and the influence of small excesses in storage is important in determining the prices of very large volumes of products currently produced and sold. Even the burdensome increase of 29.9 per cent in the storage of refined products in 1937 represented only 2.8 per cent of the total shipments for the year. During the early stages of a decline in business, a portion of demand should be met from inventory, thus freeing working capital and hastening the return to stability.

An unusual opportunity is afforded in anticipating changes in requirements because shipments of petroleum products appear to lag industrial production by more than three months. Seasonal shipments induce wide movements in the storage of particular products, but the complementary nature of their requirements permits efficient operation with a relatively constant over-all inventory. An effort should be made to counteract the present tendency of excessive supplies to be produced for several months after a decrease in demand with its resulting inventory increases. Care should also bee exercised to avoid an expansion of inventories based upon abnormal or erratic demands as contrasted with wise increases based upon stable advances in shipments.

The problem of balancing the supplies and demands of the various products is not always a simple one, especially for the individual refiner. Limitations imposed by refinery equipment, the characteristics of the available supply of crude oil and the quality requirements for the finished products often make major shifts in yields impractical or impossible. It is essential therefore that changes in the relationships of the demands for the several products be reflected in supplies as quickly as possible, if they cannot be anticipated. For the sooner the necessary adjustments are made, the smaller they would have to be to balance supplies with demands and minimize the pressures upon the price structure.

Having allowed for normal seasonal considerations, the rates of near future demand for each product, with due weight given to the level of inventories, should govern the rates of supply. In this way, internal balance would be maintained, the possibility of overrefining particularly to yield one product would

be obviated, and the necessary storage of all products minimized. Caution should be exercised to recognize unstable relationships between the rates of supply for the various products, which frequently originate in the momentum developed by preceding demand and prices or by abnormal levels of price in relation to demand. Yields of the several products should be distributed on the basis of relative demands lest the abnormalities in economic relationships of one product be translated into distortion in another.

MULTISTAGE STABILIZATION OF CRUDE OIL

By H. S. Gibson
Anglo-Iranian Oil Co., Ltd.

A process known locally as multistage stabilization has been developed in the Haft Kel field of Anglo-Iranian Oil Co. in Southwest Iran for recovery of natural gasoline. It consists of releasing the dissolved gases from crude by stages, a practice which is now common in many fields, but which so far as is known, has not been elsewhere carried to the extent to which it is employed in Iran.

With full freedom of selection the first stage of separation at Haft Kel would be carried out in the region of 750 pounds per square inch. The flowing pressures of the majority lie between 500 and 600 pounds, at constant temperature of 105° F. The first stage of separation is therefore carried out in separators located as closely as possible to the wellheads in order to obtain the highest possible pressure. The use of six stages helps to counterbalance the loss of efficiency that results from the lower first stage pressures.

Provision is made in pipe line stations and at the refinery to deal with vapor pressure of nearly 30 pounds to take care of fluctuations in temperatures between night and day.

The normal gas-oil ratio of Haft Kel crude single flashed into flow tank at atmospheric pressure is approximately 468 cu. ft. per barrel. The percentage composition of this gas by volume, together with the quantity of each component, and the amount of each remaining in solution in the crude, are given below:

	Per cent composition	Cubic feet per barrel at S.T.P.		
		In gas	In oil	Total
Methane	62.23	291.5	1.58	293.08
Ethane	10.77	50.4	1.98	52.38
Propane	10.55	49.4	7.20	56.60
Isobutane	3.35	15.7	6.25	21.95
Normal butane	4.82	22.6	12.30	34.90
Pentanes	4.48	21.0	31.60	52.60
Hydrogen sulfide	3.80	17.8	1.03	18.83
Total	100.00	468.4	61.94	530.34

Treatment by 250 pounds compression gave gasoline recovery of 2.5 gallons (U. S.) per 1,000 cu. ft.

Typical operating results of the multistage stabilization plant are given as follows. The figures have been obtained by calculation, in order to give comparable values, but are in good agreement with observed results.

	Number of stage					
	1	2	3	4	5	6
Operating press. lbs. sq. in. absolute	515	818	102	55	34	25
Temperatude, °F.	105	80	80	80	80	80
Gas evolved—cu. ft. bbl. of equivalent single flash	210.0	80.0	39.7	20.7	13.4	9.33
Atmosp. crude gas analysis—per cent volume—						
Methane	87.62	81.82	68.07	48.52	28.21	14.10
Ethane	6.12	9.12	15.48	23.96	31.37	34.90
Propane	2.64	3.94	7.65	13.33	20.20	26.00
Isobutane	.45	.61	1.36	2.42	3.74	5.00
n-Butane	.59	.77	1.51	2.77	4.28	5.89
Pentane	.39	.46	.90	1.62	2.58	3.46
Hydrogen sulfide	2.19	3.28	5.03	7.38	9.62	10.75

PROSPECTING FOR OIL AT THE HEADWATERS OF THE AMAZON

By J. E. Brantly
Drilling & Exploration Co., Inc.

The paper describes the hardships, the equipment, personnel and requirements for drilling a wildcat test in the jungle of eastern Peru. It deals with No. 1 Aguas Calientes, in the Department of Loreto, 3 kilometers north of the mouth of Aguas Calientes Creek, which empties into Rio Pachitea about 30 kilometers upstream from the latter's mouth in the Rio Ucayali. It is about 800 kilometers from the Tara field, the nearest production.

Wood was used as fuel, and the paper describes the method of setting boilers 42 inches aboveground on walls of brick and concrete to provide additional space for firing and for dealing with ashes. Fuel consumption averages 6 to 8 cords of wood per boiler day with an efficiency of about 85 per cent. All possible requirements in pipe, drilling tools, fishing tools, lines, engine and mud pump replacements were anticipated in advance because of the remote location, three months from the nearest base of supply.

The crew was hand-picked for disposition and sociability as well as ability because of the necessity of living, talking and working with the same people for an indefinite period.

Peruvian hunters were included in the personnel as the most dependable source of fresh meat supply for the commissary. Staple eatables were anticipated and shipped with the drilling equipment. Radio, phonograph, records, cards, books, and a wide assortment of games were included in the equipment to make the recreational facilities as interesting as possible.

EXPLORING DRILL HOLES BY SAMPLE-TAKING BULLETS TO SUPPLEMENT ELECTRICAL LOGGING

By Eugene G. Leonardon and D. C. McCann
Schlumberger Well Surveying Corp.

The sample-taking tool can be applied at any point in the hole desired, thus eliminating some of the expense involved in mechanical coring of uninteresting sections.

Points from which samples are desired are marked on electrical logs. The bullet, which is fired into the formation by means of a powder charge, is a hollow cylinder attached to a gun barrel and housing by two lengths of wire and the housing in turn by the supporting cable. The cylinder bullet must be open on both ends so that drilling and side-wall mud can pass through and permit the cylinder to penetrate the native formation. The cores are three-fourths of an inch in diameter and from 1½ to 2½ inches long. A housing for 6 or 18 bullets can be used in obtaining any number of cores up to the maximum from as many different levels in the hole by discharging a predetermined number at each level.

The samples of formation obtained are sufficient for the usual laboratory core analysis. The sample tool has proved valuable in establishing the oil-water contact and the paper describes the physical procedure involved.

AIR CONDITIONING AS APPLIED TO OIL FIELD BUILDINGS IN TROPICAL CLIMATES

By O. W. Johnsen and T. A. Pollard
Standard Oil Co. of California — *Bahrein Petroleum Co., Ltd.*

Air conditioning to provide reasonable comfort in dwellings and working places has proved to be a desirable investment where Caucasian employes are employed to work in tropical countries. Artificial cooling, particularly in sleeping quarters, has been found to improve working efficiency, decrease hospitalization and generally improve the morale of the organization.

Bahrein Island uses a central cooling system circulating water cooled to 50° F. and each half of the conditioned duplex dwellings has independent control. The central plant comprises two separate and independent refrigerating machines, each with its own water-cooled condenser and water chilling evaporator, a cooling tower and condensing water and chilled water circulating pumps. Hermetically sealed electrically driven compressors were chosen to minimize refrigerant leaks and feron was used as the refrigerant.

The air-cooling units employ a water coil and a motor-driven centifugal blower to deliver 600 cu. ft. of cooled air per minute.

At the A.I.M.E. meeting: C. W. Hamilton, assistant to vice president, Gulf Oil Corp., New York, producing division; W. D. Brown, United States representative, Anglo-Iranian Oil Co., Ltd., New York; E. S. Bleecker, geologist, Gulf Oil Corp., New York, production division; Samuel Haskell, Texas Co., New York; C. Woessner, engineer, Gulf Oil Corp., New York, producing division

KANSAS

THE REPUBLIC NATURAL GAS CO., a Delaware corporation, challenges the constitutionality of the Kansas oil and gas proration statute in a suit instituted in a three-judge federal court sitting in Kansas City, Kans., this week, Judges Bratton, Vaught and Hopkins sitting. The hearing is expected to continue for several days.

Kansas' oil proration statute, enacted by the 1935 session of the legislature, provides for the proration of gas and the spacing of gas wells, specifying one well for each 640 acres or portions thereof.

The corporation, according to its attorney, Robert C. Foulston, Wichita, owns 108,300 acres in the two counties, operates 88 gas wels, capable of producing 100 million cubic feet of gas a day. Its holdings, including 150 miles of pipe line, represent an investment of about $4,000,000, it was said.

Charging them unconstitutional on the basis that there was no competent evidence introduced to support the orders, the petition further aleges that the regulations placed on the company's production are unfavorable as compared with those placed on other individuals. The gas corporation is asking a permanent injunction against the orders.

KENTUCKY

GOV. A. B. CHANDLER of Kentucky was scheduled to confer with Governor Phillips of Oklahoma Wednesday night after Chandler's address to the League of Young Democrats at Enid, Okla.

Governor Phillips said he was arranging for the conference to discuss subjects in which both states are interested, particularly oil. He has invited Chandler to dinner at the Governor's Mansion.

ILLINOIS

AN IMPORTANT CONFERENCE WAS HELD in St. Louis, Mo., on Sunday between Governor Leon C. Phillips of Oklahoma and Acting Governor John Stelle of Illinois in which the two executives and their respective accompanying staffs discussed the petroleum situation from many angles. The meeting consumed over three hours time and according to those present there was not an idle moment. It was mainly a question and answer conference in which Acting Governor Stelle was the main questioner.

The conference was called for the purpose of inducing Illinois to join with other states in conserving its petroleum resources. Acting Governor Stelle has been an advocate of unrestricted production and drilling operations until such time as the state's production equals its consumption in petroleum products "plus Illinois' rightful share of the nation's demand for oil products." At the close of the meeting he is quoted as saying that he had learned more about the oil business than he had known before, but was quoted as having said after the meeting "we want adequately to care for any market for Illinois production."

RICHARD WEBSTER LECHE, governor of Louisiana, was born in New Orleans May 17, 1898. Student at Tulane University 1916-18. Received LL.B. at Loyola University, New Orleans, 1922; LL.D. at University of Laval, Quebec, in 1937. Admitted to bar in 1922. Secretary to Governor Huey Long, 1932-34; judge, Court of Appeals, 1934-36. Governor of Louisiana since 1936.

STATE CAPITALS

THE CENTRALIA (ILL.) SENTINEL, which in the early period of the present Illinois oil development was an earnest believer in unrestricted production in the state until crude production is equal to the state's consumptive demand, had this to say in a recent issue:

"For months a movement to enact regulatory oil measures in this state has been simmering, kept alive by the protests of other oil producing states against unrestricted Illinois production.

"The sentiment of many independent operators who a few months ago were counted opponents of any proration measures, has shifted to the other side in recent weeks because of increasing difficulties facing operators attempting to market their production.

"Those who have changed their stands now argue state proration, provided it was on a moderate scale, would induce more capital into the state.

"As conditions now exist, they said, operators are forced to sell their production at as little as 40 cents a barrel because they cannot obtain other markets.

"Advocates of regulatory measures insist the revenue to independent operators would be much greater under state proration than it is now.

" 'If an operator could sell 50 bbls. a day from each of his wells at $1.15 a barrel, he would be assured of a satisfactory return on his investment,' one prominent oil man remarked. 'As it is in some instances at present, operators are losing money on their wells in an attempt to convert their production into immediate cash.' "

INDIANA

AN OIL CONSERVATION BILL, House Bill 214, has been introduced in the legislature which would give the state broad powers to regulate the oil and gas output of the state. It would be administered by tax of one-half cent a barrel on production.

NEBRASKA

TWO BILLS HAVE BEEN INTRODUCED in the Nebraska Legislature of much interest to western oil men and which are intended to encourage wildcatting in the hope of discovering oil in that state. Both were submitted by Harry E. Gantz, of Alliance. There is no opposition to either of them, but their passage may depend upon emphasizing their importance and creating an active interest in them.

One of these is L.B. 300, which proposes to amend Section 76-502, Compiled Statutes of Nebraska, 1929, so as to permit foreign corporations to lease Nebraska lands for oil and gas purposes for a longer period than five years, and to permit them to take long-term surface leases on land necessary for such activities and to acquire fee title to land so used. Present laws are unduly restrictive in these respects.

TEXAS

F. W. FISCHER, TYLER ATTORNEY, and Senator Joe Hill of Henderson, urging an increased allowable in East Texas, and J. S. Abercrombie of Houston, arguing Gulf conditions were not comparable to East and North Texas, featured the statewide hearing before the Railroad Commission Monday. Fischer said special allowables were given to the Gulf Coast and West Texas, and Abercrombie retorted that if East Texas had its wells on 15 acres it would not be objecting.

G. A. Sadler, new commissioner attending his first hearing, said he wanted all the information on record so he could make recommendations. D. J. Gray of Wichita Falls suggested a barrel of oil for every 100-foot depth as a basis. Mark McGee, Fort Worth, asked an exception for Cayuga. E. B. McFarland, Wichita Falls, said the K.M.A. allowable was out of line.

Hines Baker said it would take 42 to 90 years to deplete Gulf Coast reserves one half, showing a sound basis of operations.

EXTENSION OF TEXAS' OIL PRORATION law on a two-year basis was reported favorably by the house committee on oil, gas and mining.

The committee heard Railroad Commissioner Jerry Sadler recommend the two-year extension rather than a permanent plan advocated by several leading bankers and oil men of Texas and voted, 9 to 4, to pass the amendment to the house floor.

E. L. Smith, former president of the East Texas Chamber of Commerce, warned the committee that a breakdown in present proration laws would cause a chaotic condition and "break practically all small operators."

MICHIGAN

AN OIL AND GAS CONSERVATION measure has been introduced in the Michigan Legislature by Representatives Thompson, MacKay, and Hampton, providing for a supervisor of wells to be known as the director of conservation; an advisory board and an appeal board, and providing for rules and regulations covering the exploration and exploitation of crude oil and natural gas within the state. The bill provides that the director of conservation be appointed by the state Commission of Conservation, and that he, after consulting with oil and gas producers, and with the approval of the Conservation Commission, set up an advisory board of practical oil and gas men all residents of the state. The appeal board shall be the Commission of Conservation.

OKLAHOMA

A MARKET DEMAND HEARING of purchasers and producers with the oil conservation department of the Corporation Commission will be held in Oklahoma City Friday, February 24, at 10 a.m. Recommendations will be formulated for presentation to the Corporation Commission at the formal hearing for the March market demand in the commission's courtroom at 2 p.m. of the same day.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Official Notice

The report of the National Resources Committee is probably the most important document affecting the oil industry that has come out of Washington since the N.R.A.

The fact that the report was called to the attention of Congress by the president and that the committee includes several cabinet members gives it an official tone so far as this administration is concerned.

It indicates clearly along what lines Washington is thinking in regard to the future of the oil business.

The actual recommendations, it is worth noting, were prepared by the energy resources committee composed of representatives of the Army and Navy, the government bureaus, and competitive industries, with the oil industry a minor factor.

The report definitely holds that, under the interstate commerce and national defense clauses of the Constitution, the federal Government has wide powers to regulate oil and gas powers which have never previously been exercised over the operations of the industry.

"We propose," it says, "that a federal oil conservation board or commission should be created within the appropriate government department to administer the federal interest in the oil and gas industry and to make necessary rules and regulations concerning the production of and commerce in oil and gas."

This about covers the whole subject of conservation and proposes that the federal Government be placed in position to do whatever it decided should be done regardless of what has been the practice in the past.

The report recognizes that the states have certain constitutional rights but it leaves the impression that these should not prevent federal regulation, because, it says:

"The problem of conservation has not been solved by the regulation of the petroleum industry now in force in those states that have laws. No state is now in position to protect itself from another state, and, consequently, no state can in equity to its own industry enforce regulations appreciably more effective than those of other states competing for the same market."

Further recommendations of the committee are the dropping of duties on imports of oil, the federal Government's taking over of submerged oil areas in coastal waters, and requiring state legislatures to terminate the law of capture, all proposals demanding the attention of everyone connected with the operations of the oil industry.

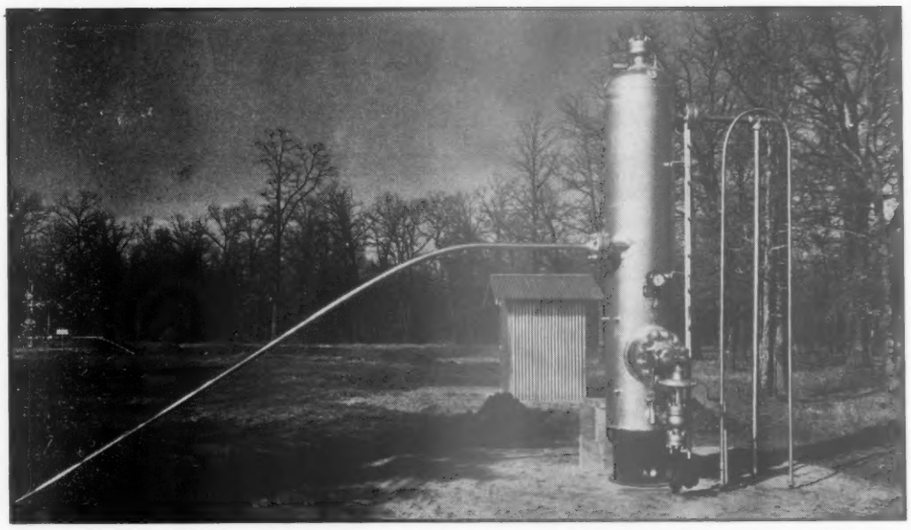
The tenor of this far-reaching report offers insistent proof of the necessity for the states and the industry to renew and intensify their efforts with determination to perfect the enforcement of conservation.

It emphasizes the immediate need for all oil-producing states to unite in doing their full share if they wish to avoid federal regimentation that would be infinitely more restrictive than any state regulation ever could be.

Nor should it be forgotten, as this report pertinently points out, that "the state looking to the future of its tax returns should recognize that, although under wide open production there may be a large tax fund immediately available, the total is sure to be reduced in the long run by the reduced ultimate production."

Both from this standpoint of state revenue and of home rule the oil-producing states should heed the ominous warning that "unless the problems can be solved by the regulatory approach we may anticipate there will emerge an insistent and eventually irresistible demand for public ownership and control."

That seems where this committee and the administration is heading unless the states and the industry can head them off.



High-pressure separator, metering house and hook-up on a gas-distillate well in the Cayuga field. Gas pressure is reduced in stages, the distillate knocked out and the residue returned to the shallower Woodbine sand

CONTINUE SEARCH

(Continued from Page 43)

lower Marine and Travis Peak, the well was completed in lower Trinity Pettit with a daily potential of 26 bbls. of distillate and 5,000,000 feet of gas. The two companies later in the year drilled a second well 1½ miles southwest of the discovery, completing it for a potential of 7,200,000 feet daily.

Since gas-distillate has been the only production discovered to date, except the discovery well at Opelika which is producing through drill pipe from a stray sand in the lower Glen Rose, future development in proven areas will depend to a great extent on gaining outlets for the gas or through construction of recycling plants. Railroad Commission rulings require that all gas produced with the distillate be utilized and allow the wells to flow only 25 per cent of their potential. At Cayuga recycling is being carried on at a high rate, but at Opelika no plant has been built to care for the three wells and no commercial market has been developed for the gas.

High-Pressure Gas

One market for high-pressure gas which is expected to show a huge increase in the future is that offered through gas lifting in the East Texas field. As more and more wells are placed on the pump, East Texas operators are showing a greater interest in flowing their wells by gas lift. Until recently the only available source of extraneous gas at an adequate pressure for use in gas-lifting operations was that furnished by a commercial gas company. High cost of such gas permitted it to be used only as makeup gas. Discovery of the high-pressure gas in Gregg and Smith counties, however, offered them a large, comparatively cheap source of high-pressure gas.

In the latter part of 1938 a line was laid from Hunt No. 1 Bradley into the southwest part of the field and its principal use will be to supply high-pressure gas for flowing wells. Several wells have tied into the line, which has a maximum pressure of 500 pounds per square inch. As yet no line has been laid from the Gulf-Humble wells at Willow Springs, but it is anticipated that high-pressure lines will be laid into the field in the near future. When this is done, operators will have available some 21,000,000 feet of high-pressure gas for gas-lift operations. This would greatly reduce the cost of equipping a lease for gas lift, because the cost of installing compression is eliminated. Also shutdowns due to mechanical failure of equipment are avoided.

Commission Findings

The Railroad Commission during the past year conducted a number of hearings and made intensive studies of wells producing high-gravity, highly volatile liquids at high gas-oil ratios in order to determine methods of producing these wells to obtain the greatest ultimate recovery and to determine proper utilization and disposition of the natural gas produced from such wells.

Briefly, its findings were: (1) That distillate or condensate production is encountered where natural gas is found at comparatively great depths and high pressures; (2) that if the pressure in such gas reservoirs is reduced, the gas-liquid ratio is increased if conditions under which gas-liquid separation occurs remain the same; (3) that if the pressure in such a high-pressure, gas-phase reservoir is allowed to drop, retrograde condensation occurs with the liquid wetting the sand grains, thereby preventing the recovery of a large portion of the liquid formed in this manner unless the pressure of the reservoir is raised back to its original value. Therefore, to prevent waste of the natural gas produced with the distillate and in order to obtain maximum recovery of distillate, the Railroad Commission recently issued an order to the effect that:

". . . all wells within the confines of the State of Texas which produce hydrocarbon liquids which are condensation products from a gas phase are hereby classified as gas wells under the provisions of Article 6008 and the use of the natural gas produced from such wells shall be restricted to the purposes and uses provided for in Article 6008 for the type of gas produced; that all wells producing hydrocarbon liquids, a part of which is formed by a condensation from a gas phase and a part of which is crude petroleum oil, shall be classified as gas wells, and the natural gas produced from such wells shall be devoted to the uses and purposes described and set out in Article 6008 as the purposes and uses for which natural gas from gas wells may be used, unless there is produced 1 bbl. or more of crude petroleum oil per 100,000 cu. ft. of natural gas; and that the term 'crude petroleum oil' as used in this order shall not be construed to mean any liquid hydrocarbon mixture or portion thereof which is not in the liquid phase in the reservoir, removed from the reservoir in such liquid phase, and obtained at the surface as such."

Several gas recycling projects are now under way, or are planned, in various eastern Texas fields. In the Joaquin field of Shelby County, Portex Oil Co. recently placed in operation the first unit of a project that will eventually have a total gas capacity of 400,000,000 cu. ft. daily, if present plans are carried out. American Liberty Oil Co. has just started construction of a 15,000,000-foot unit near Grapeland, in Houston County. In the Long Lake field of Anderson County, Byrd-Frost, Inc., has one plant in operation and a second plant is being built by Champlin & Bass, Inc., and others.

Cayuga Recycling

In the Cayuga field recycling of gas produced from the lower Glen Rose or Trinity formation and from the Woodbine horizon is being carried out with very successful results. Tide Water Associated Oil Co. and Seaboard Oil Corp. has two repressuring units taking gas-distillate from the lower Glen Rose, recovering any condensate knocked out at the separator and returning the residue gas to the Woodbine sand. In one system (see Unit 1 in the following table) gas is produced from their No. 15 J. N. Edens and injected into No. 9 J. N. Edens; in the other (Unit 2) gas is taken from their No. A-21 N. N. Willis and returned to the No. A-27 Willis. Roeser & Pendleton, Inc., also have a like installation in the field, taking Trinity gas from its No. 3 V. W. Bowyer and returning a large portion of the residue to a Woodbine input well, No. 1 V. W. Bowyer. A summary of a recent month's operation of these three recycling projects is as follows:

	Tide Water-Seaboard		Roeser &
	Unit No. 1	Unit No. 2	Pendleton
Monthly gas production, cu. ft.	139,029,000	103,758,000	101,010,000
Condensate recovered, bbls.	1,953	1,307	5,160
Yield per 1,000,000 cu. ft., bbls.	14.05	12.59	51.08
Separator pressure, lb./sq. in.	1,570	1,630	1,445
Residue gas, recycled, cu. ft.	139,029,000	103,758,000	72,000,000
Residue gas sold	.....	.....	29,000,000

In addition to the above two recycling units, Tide Water-Seaboard operate another plant recycling Woodbine gas from two producing wells. Present plant capacity is 12,500,000 cu. ft. daily. However, this is being doubled to 25,000,000 cu. ft. daily and three more producing and injection wells being drilled. A month's summary of this plant's operation shows that 388,046,000 feet of gas was processed and 6,859 bbls. of 81.9-gravity distillate recovered, or a yield of 17.68 bbls. per 1,000,000 cu. ft. of gas processed.

In this project, as well as in the others described, care is taken that all gas, minus losses or sales, withdrawn from a lease is returned to it. Thus, if 1,000,000 cu. ft. is produced from the Trinity on Lease "A," this amount (less extraction loss and operating loss and any sales) is returned to the Woodbine. Likewise in recycling Woodbine gas.

Newest lower Marine Trinity tests for the East Texas basin are in Wood and Upshur counties. R. E. L. Johnson and others No. 1 Parker, in the Coy Survey, Upshur County, now drilling below 3,000 feet, is to be carried to the basal Glen Rose expected at around 6,500 to 7,000 feet providing the test continues to run structurally high. In the Jesse Walker Survey of north central Wood County, George Strake has staked No. 1 W. C. Farrier on a block of 6,000 acres. It is contracted for 6,500 feet. Completion of Barnsdall Oil Co. No. 1 Tubb, in the lower Trinity pay of the Cayuga field, and the Tide Water-Seaboard-Humble companies No. 1 S. S. McGee, in the Opelika field, as gas-distillate wells temporarily leaves the area without a deep test drilling below the Woodbine sand.

Fled Law Career; Is Oil Head at 89

By T. F. SMILEY

The folks wanted John to be a lawyer. John didn't want to be a lawyer. So he ran away from home and—well, he's the John Wesley Van Dyke who became the power house of the Atlantic Refining Co. and who at 89 is chairman of the board, oldest active head of any major oil company, both in years and service.

This was back in 1867, when running away from home was a common method of resolving domestic differences of view besides offering an inviting outlet for the spirit of adventure.

The fact is neither John's father nor his grandfather seems to have been a particularly reposeful sort of person. The grandfather, William Van Dyke, had settled near Mercersburg, Pa., when that region was sparsely settled and literally had chopped and grubbed a fat farm out of the woods. The father, William R. Van Dyke, kept the farm in a high state of cultivation, added to it the business of a drover, and then when the Civil War broke out he forthwith got into it, notwithstanding he was married, near middle life and had six children. He fell at Dranesville almost before he had got the feel of his blue uniform.

Had It All Fixed

Grandfather Van Dyke died in 1865, and according to family plans formulated in connection with settlement of the estate John Wesley was to go to law school and then "read law" in the office of an uncle. The boy, now 18, had attended the Mercersburg schools and Tuscarora Academy. A law career interested him not at all.

In the clash of opinions concerning John's future, Dutch fixedness of purpose was apparent. One day John, without the formality of saying goodby, headed for the oil fields of Venango County, where he had heard a common laborer could make $2 a day, and more than that if he mastered the intricacies of skilled work.

He took the first job offered, that of clerk in a store. Not what he wanted, but it would pay for his keep while he looked for something better. In a short time he was working for H. A. Wise, governor of Virginia from 1856 to 1860, who after the war had joined the fortune hunters along Oil Creek and the Allegheny River.

First young Van Dyke worked as a pumper, then tool-dresser, then driller. He liked the looks of a tract of land near McClintockville, the spot from which Coal Oil Johnny launched his short but dazzling revel. He urged Mr. Wise to buy it, but the former governor was skeptical. So John bought it himself, with the help of $1,000 borrowed from his mother. He sold it at a profit.

Not long afterward John, not yet 21, got an oil lease across the Allegheny River from Reno and brought in two wells. About this time he met John Hill in a Rouseville boarding-house. Mr. Hill went to New York to manage the Long Island refinery of the Standard Oil Co. and he engaged John as master mechanic at $5 a day. Affluence.

When Sone & Fleming sold their big Brooklyn refinery to the Standard Mr. Van Dyke, now 30, was made manager of the plant, and from that time he filled a more and more important place in refining activities of the New York area.

With the opening of the Lima, Ohio, field the Standard sent Mr. Van Dyke there to install and superintendent the Solar Refining Co. plant. Kerosene was the major product; but Lima's sulfur-laden kerosene was not salable for use in lamps because of its odor, which combined the high tang of boiled cabbage with a dash of polecat. Herman Frasch, a chemist employed by the Standard, developed a method of desulfurizing the crude, and Mr. Van Dyke made a practical adaptation of it in the refinery.

The headquarters of the Solar Refining Co.'s president were in Standard Oil's New York office. Mr. Van Dyke was not only in direct supervision of the Lima refinery, but he aided in working out engineering problems which confronted the Standard at other points. For instance, there was the one of increasing the yield of wells in lime formation. Mr. Van Dyke conceived the idea that introduction of hydrochloric acid into the hole under pressure would achieve this end. Trial proved it would. The acidizing process, modernized, is in wide use now.

Tankcar accidents were occurring with disturbing frequency, creating probability that oil products would be classified as explosives and banished from railroads. Mr. Van Dyke designed two types of tankcar, so strong and safe that their principles of construction have been preserved to this day.

Mr. Van Dyke's direct connection with Atlantic Refining began in 1903, when he was made manager of its Point Breeze plant. Since 1892 all the Standard's refineries in Pennsylvania and Delaware had been grouped under Atlantic's control, and the latter company's capitalization had been raised from $400,000 to $5,000,000. The New York office of Standard Oil provided the required crude, directed each plant where to ship its products and named the prices. Upon refinery managers fell the task of reducing manufacturing costs and keeping operating efficiency at a high level.

Mr. Van Dyke concentrated his efforts on improving refinery technique. W. M. Irish, who retired as president of Atlantic in 1937, had come with him from Lima. They invented the tower still, which was installed in every Standard plant, effecting a saving of some $17,000,000 annually.

When the Standard Oil Co. was dissolved in 1911 the Atlantic Refining Co. had three major refineries, each formerly under immediate supervision of the New York office. It had no foreign sales organization, though most of its business was oversea. It had no domestic sales force outside of Pennsylvania and Delaware. It virtually was without working capital. And it owed $9,000,000 to formerly affiliated companies. Officers and directors had been men from the parent organization, Standard of New Jersey. With their resignation Mr. Van Dyke was made president.

While he struggled to preserve the foreign market the home market was spawning new problems. Competition was becoming active in the lubricant trade, and kerosene was being supplanted by electric lighting.

Then came the automobile.

In 1915 the Atlantic, under Mr. Van Dyke's direction, opened in Pittsburgh, Pa., the first modern service station. It was an immediate success. Service stations soon dotted the country.

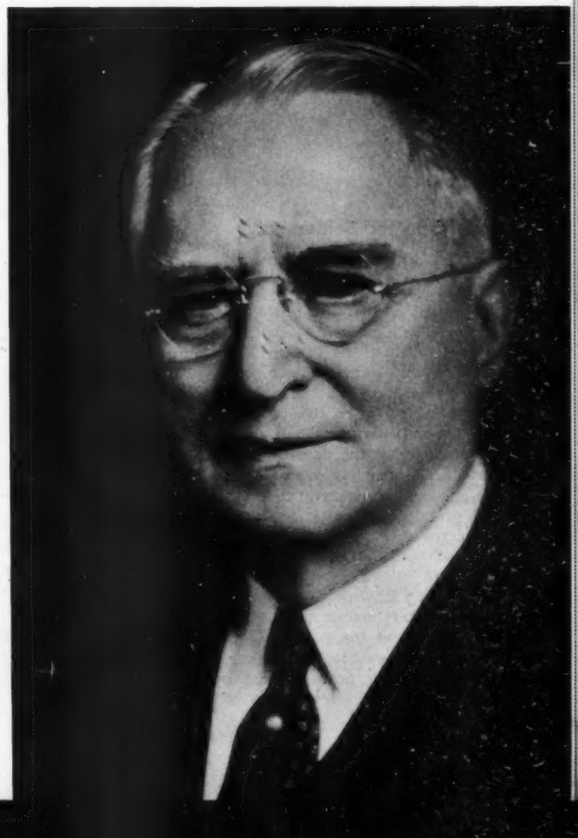
The World War interrupted the plans for expanding Atlantic's home markets, but demand for a special type of aviation fuel rose, and after the United States entered the war more than half the aviation gasoline sent overseas is said to have come from the Point Breeze refinery.

They Stopped That

German fliers were attaining greater speed and altitudes than their foes. Analysis of fuel taken from a captured German plane revealed why. Every Allied combat plane soon was using a fuel superior to the Germans' and all of it was said to have been produced in Atlantic refineries.

The war over, Mr. Van Dyke pushed to completion his plan of making Atlantic an integrated company. It now has production in Oklahoma, Texas, Kansas, and New Mexico. Most of the crude is sent to the company's Gulf Coast terminals by its own pipe lines. A fleet of 22 tankships has been built up. The company has marketing outlets in 14 states and in foreign lands.

Within a decade of the century mark, Mr. Van Dyke is still the man of undimmed vision and inventiveness, the restless seeker after better ways of doing things. A late achievement is the Atlantic's refinery at Atreco, Tex., described elsewhere in this issue. Within the recent past he devised and patented a pipe-line end protector. New needs capture his imagination. His eyes are trained on the road ahead.



J. W. Van Dyke, chairman of the board, the Atlantic Refining Co.

Judge Stone's Decision Upheld By Circuit Court of Appeals

CHICAGO, Feb. 20.—The U. S. Circuit Court of Appeals here affirmed the right of federal Judge Patrick T. Stone of Madison, Wis., to dismiss charges against one company and 10 individuals after they had been convicted by a jury in the gasoline antitrust case at Madison, Wis.

The decision denied a petition of government attorneys for a writ of mandamus on the contention the judge erred in freeing the 11 defendants.

Judge Otto Kerner handed down the decision in the circuit court. Concurring were Judges J. Earl Major and Evan A. Evans.

The appeals court held that to grant the Government's petition for a mandamus, expunging Judge Stone's action, would violate the defendants' constitutional guarantee against double jeopardy.

"To agree with the petitioner that the prosecution is entitled to a new trial, after the issues have been fully tried in a trial by judge and jury and after the Government has failed to prove its case against the defendants, is a monstrous penalty to impose upon the defendants," Justice Kerner wrote. "To grant the prosecution a new trial after a judgment of dismissal has been rendered pursuant to its reservation of power to wrest the case from the jury, if the case turned on a purely legal question, is to create a right that has never before existed.

"The creation of such a right in this case would come very close to violating the ancient doctrine codified in our Constitution that the accused shall not twice be put in jeopardy of life or limb for the same offense."

The court found that Judge Stone was entirely within judicial procedure in serving until after the jury verdict a ruling on the defendants' petition for dismissal.

"To say that mere postponement of a ruling in favor of the defendants bars the ruling completely is going beyond all bounds in giving the Government a right based purely on a change in procedural form," the opinion said.

"In substance, there is no difference between a directed verdict of acquittal and a judgment of dismissal. It is only when the procedural change is fundamental and substantial injustice occurs that one of the litigants should be allowed to complain. In this case the Government, as well as the defendants in a criminal case, has a thoroughly considered ruling on an important legal question, which is exclusively within the province of the court. . . .

"There has been no encroachment on the proper province of the jury. The essence of legal power is to take the case away from the jury, where there is an insufficiency of evidence to sustain a conviction. The power to direct a verdict and the power to render a judgment of dismissal are clearly incidental to, and necessarily flow from, the judicial function of determining legal sufficiency of the evidence. The court has inherent power to invoke these procedural aids in its effort to administer criminal justice. . . .

"It is true that no federal statute specifically sanctions the procedural action taken by the trial court. On the other hand, there is no legislation of Congress which forbids the adoption of such procedure. The absence of legislation justifies resort to the procedures known at common law. In the absence of express prohibitive legislation, United States courts observe common law procedure in criminal cases, as modified by the state in which the trial is held, and as of the date that state was admitted into the union.

"We think that the trial court possessed inherent power to render a judgment of dismissal pursuant to the reservation of an issue at law, when deemed essential by it for the proper administration of justice.

"We conclude, therefore, that respondent (Judge Stone) in fact reserved his ruling on the preverdict motion and that as a consequence he was exercising his clear discretionary power in eliminating the embarrassment and confusion that had arisen."

Sinclair Prairie Cuts Prices on Oklahoma Kansas Low Gravities

Price reductions on low-gravity crude oil in Oklahoma and Kansas ranging from 4 cents to 22 cents a barrel were posted by Sinclair Prairie Crude Oil Marketing Co., effective at 7 a.m., February 16. Prices for oil of 33 gravity and above were unchanged.

The changes in schedules follow:

Gravity—	Old prices	New prices	Reduction
25-25.9	$.80	$.58	$.22
26-26.9	.82	.63	.19
27-27.9	.84	.68	.16
28-28.9	.86	.73	.13
29-29.9	.88	.78	.10
30-30.1	.90	.82	.08
31.31.9	.92	.86	.06
32-32.9	.94	.90	.04

Still Hope for Settlement In Mid-Continent Strike

Although no immediate results came from the two-hour conference in the office of Gov. Leon C. Phillips of Oklahoma on February 18, the fact that it brought together the principals on both sides of the Mid-Continent Petroleum Corp. labor dispute, gives encouragement to those hoping for a settlement. Dr. James Steeleman of the conciliation service of the U. S. Labor Department, had suggested to J. C. Cooper, commissioner of the department, that negotiations be started. The company was represented by J. C. Denton, vice president and general counsel, and Fred B. Koontz, vice president in charge of the refinery; the union by Harvey C. Fremming, international president C.I.O. Oil Workers; J. L. Coulter, international vice president, and R. H. Stickel, international representative.

Governor Phillips said another meeting might be arranged after further information had been gathered. Cooper believed the conference laid the groundwork for further negotiations. However, spokesmen for the company and the union did not share this optimism. The chief issue is the disposition of 240 strikers discharged by the company. There are indications the company is disposed to take up each case separately, all men discharged not being held equally responsible.

The National Guard on duty in West Tulsa has pushed forward the sentry line on the street leading to the refinery. Reports of acts of vandalism continue from the field and the West Tulsa area.

Negotiations With Mexico on Expropriated Properties

NEW YORK, Feb. 20.—It is reported that Donald R. Richberg and Patrick J. Hurley, representing American oil companies, will open negotiations at Mexico City within two weeks regarding the expropriated properties. In this connection the New York Times says that in recent discussions in Washington, in which President Roosevelt, the State Department, the Mexican ambassador and representatives of the oil companies participated, an arrangement in principle is said to have been reached whereby the oil companies would take over the management and operation of their respective properties under a long-term contract, while the title to the oil-producing properties would be vested in the Mexican Government. It is understood the oil companies will insist that any such contract run for 50 years.

The tentative arrangement provides further that the properties be returned to the oil companies free of any restrictions, claims or obligations not specifically set forth in an agreement.

Obituaries

MICHAEL HOLLORAN, 79, a pioneer gas and oil contractor, died in Indianapolis last week. He had drilled wells in Kentucky, Illinois, and Indiana more than 40 years. He was born in St. Catherine's, Canada.

GEORGE O. SUMAN, 77, father of Vice President John R. Suman of the Humble Oil Co. of Houston, Tex., died in Hollywood, Calif., last week.

W. G. Fitzpatrick Appointed Manager of Sales

W. G. FITZPATRICK

The Continental Supply Co. announces the appointment of W. G. Fitzpatrick to the position of manager of sales, with headquarters at Dallas, Tex., effective as of February 20, 1939.

THE MARKETS*

CRUDE OIL: *Sinclair Prairie Oil Marketing Co. reduced crudes from 25° to 32° gravity in Oklahoma and Kansas from 4 to 22 cents per barrel. Most of the crude involved in this change comes from stripper wells and the reductions are partially due to high cost of gathering. Considerable crude offered under posted prices in Illinois.*

REFINERY: *Firmer gasoline market reported in several refining areas with minor changes in quotations. Natural gasolines steady. Weakness in practically all grades of fuel oil, gas oil and distillate reported in Mid-Continent. Lubricants generally stronger.*

TANK-WAGON AND POSTED DEALER: *No general changes but prices on gasoline and kerosene lowered at several points. Average gasoline prices lowest in several years.*

FINANCIAL: *Averages moved with a range of less than 75 cents for week with oil market generally inactive. Average of 30 representative oil stocks for week ending February 18: High, 27.73; low, 27.03; close, 27.42. Week ending February 11: High, 27.78; low, 27.09; close, 27.34.*

ANNUAL REPORTS†

	Net income	Earned per share
Standard of Kansas:		
1938	$ 557,831	‡$5.25
1937	781,873	‡6.93
Texas Corp.:		
1938	23,500,000	2.15
1937	54,574,319	5.02
Indiana Pipe Line:		
1938	141,853	0.47
1937	309,039	1.03
Union Oil of California:		
1938	6,862,758	1.47
1937	12,061,332	2.58

**Additional information in Market Section.*
†Furnished by Carl H. Pforzheimer & Co., New York.
‡Based on 106,190 shares in 1938 and 112,837 shares in 1937.

INTERNATIONAL

A.I.M.E. Foreign Paper Abstracts

VENEZUELA

By J. Terry Duce

Texas Co.

Crude oil reserves of eastern Venezuela, exclusive of the Quiriquire field, will run into figures with nine zeros, Mr. Duce said. He sketched the Jusepin field discovery by Standard Oil Co. of Venezuela, and the blowout of the El Roble well drilled by Standard of Venezuela on Pantepec acreage in the central part of Anzoategui. He also touched upon the exploitation in the new Bachaquero field, the most southern along the eastern shore of Lake Maracaibo.

Reference was made to the 16-inch pipe line to run from the Mene Grande Oil Co. Oficina district north to the port of Guanta. From other sources, it was learned that pipe for the line has been ordered and part of it is now en route to Venezuela. The contract for construction will be let in the near future. Several United States construction contracting firms have entered bids on the building of this line. Since decision was reached to proceed with it several months have been spent in constructing a road along the right of way since it traverses sparsely settled territory.

Development in the Tembiador field, a fault structure, was outlined in a general way and the point was made that production is now averaging about 5,600 bbls. per day.

TRINIDAD

Crude oil production in Trinidad exceeded all previous records in 1938 totaling 17,737,061 bbls. for the year compared to 15,502,989 bbls. for 1937. Through the end of 1938 Trinidad's accumulative crude oil production totaled 162,818,403 bbls.

There were 231 wells completed during 1938 and 41 were abandoned, leaving 1,304 on the active list. Of the total active wells, 850 were temporarily shut down. The status of wells actually on production follows: 428 wells were flowing, 516 were pumping, 81 were on gas lift, 123 were on plunger lift and 156 were producing by methods classified as miscellaneous.

Chief development during the year was along the Guapo fault extending from Point Ligoure to Coora across the southwestern part of the island. The Coora field is now one of the most important in Trinidad. Another productive area has been developed on the north side of the fault at Los Bajos while several widely spaced wells along the fault in the intervening area suggests that the whole 7 miles between Los Bajos and Coora may prove productive.

The Penal field was placed on regular production during the early part of 1938 upon completion of a pipe line to Point Fortin where refining facilities are located.

Down flank extensions of the producing structures of Forest Reserve, Kern and Point Fortin have considerably expanded the proven acreage in these areas and exploitation of the deeper Cruse sand at these same points has contributed to enlargement of reserves.

Wildcat exploration expanded in keeping with the accelerated pace of general activity. Four tests were completed in the Mayaro district, four at Moruga, six at Cedros, six in the Morne Diable area, one at Erin and one at Point Ligoure.

The exploration of the northern basin, north of the central range, advanced to the active drilling stage last year following a long period of geophysical and geological work. Two locations were spudded with heavy-duty Diesel rotary rigs supplied by United States equipment manufacturers and each is designed to drill to 10,000 feet or deeper. The loose unconsolidated character of producing sands in Trinidad fields presents the major producing problem. In the initial flowing stages most Trinidad wells are choked with from 5/32- to 8/32-inch beans to retard movement of sand to the wells. Under the producing practice employed initial flowing output of more than 500 bbls. per day from new wells is seldom exceeded. The use of fine screen liners in combating sand trouble has not proved universally practical due to the fineness of material. More recently the practice of wrapping liners with fine gauge screen has been successful and this method of delaying or avoiding sand trouble is spreading in application.

COLOMBIA

By O. C. Wheeler

Chief Geologist

International Pet. Co.

The past year was the most active yet in prospecting, development, drilling and extension of reserves. Colombian Petroleum Co. drilled 22 wells and started a 12-inch line from the Barco to Covenas, a distance of 260 miles. It is reported that 58,000 bbls. daily initial production was established during the year.

Applications were made for concessions covering more than 1,100,000 acres of national land.

Leasing extended into the inaccessible llanos of eastern Colombia. Seismograph and gravity meters were used extensively.

Colombian Petroleum Co. completed 17 producing wells in the Petrolea field with one dry hole. Three producers with a total initial daily potential of 4,844 bbls. were completed in Rio de Oro section of the Barco. A wildcat test on the Leoncito faulted anticline was abandoned at 3,045 feet and a test was drilling on the Carbonera fault zone at 1,400 feet when the year closed. Socony-Vacuum, holding a sizable area north of Tropical's property and between Rio Sogamoso and Rio Lebrija, abandoned No. 1 Narino below 6,500 feet and had selected another location.

Tropical Co. drilled 111 wells in 1938 on De Mares concession and only one was a failure compared to only 70 completions in 1937.

A Cretaceous test on La Circa structure reached 7,983 feet. Two tests on the Putana concession were bandoned, No. 2 at 2,793 feet and No. 3 at 7,522 feet.

Applications accepted before 1938 but concessions not yet granted:

Company and district—	Date filed	Hectares
Socony-Vacuum, Rio Sogamoso	9- 1-36	27,040
Sindicado de Invessiones S.A., Rio Lebrija	6- 4-37	45,905
Evaristo Obregon, Rio Ermitano	7- 9-36	42,546
National concessions awarded from 1931-1938.		
Sociedad Nacional del Carare, Rio Carare	9-22-36	33,476
Mora (transferred to Shell Oct. 27, 1937), Rio Carare	9-28-37	50,000
Luciano Restrepo (transferred to Socony-Vacuum), Rio Sogamoso	9-19-34	49,232
Compania de Petroleo Shell de Colombia, Rio Carare	3- 2-38	49,906
Compania Colombiana de Petroleos, El Condor, Rio Cimitarra	9-15-38	47,810
Consorcio Minera Nacional Concession (transferred Shell March 3, 1938), Rio Carare	2-22-38	44,258
Compania de Petroleos del Carare, Rio Lebrija	3-15-38	49,636
Compania de Petroleos El Libertador, Barranquilla	5-25-38	20,141
Tropical Oil Co., Putana-Sogamoso	3- 1-33	7,430

The following applications were accepted in 1938 but concessions not yet granted:

Company and district—	Date accepted	Hectares
Tropical (Sucursal Colombian), Rio Cimitara	Aug. 5	16,927
Compania de Petroleo Shell de Col., East Colombia	Aug. 1	100,000
Socony-Vacuum Oil Co. of Colo., Rio Sinu	Oct. 5	44,954
Texas Pet. Co., East Colombia	Dec. 3	100,000
Richmond Pet. Co., Rio Simiti	Mar. 15	49,000
Mora F. Pelaez Hnes., Rio Mencro	Mar. 16	42,336
Luciano Pestrepo, Buenavista	Dec. 5	49,199
Carlos de Narvaez, Buenavista	Dec. 5	36,015
Frederick R. Ryan, Rio Sogamoso	Jun. 22	19,328

IRAN

Review contributed by Anglo-Iranian Oil Co., Ltd.

Expansion of the exploratory drilling program, preparations to start commercial withdrawals from the new Gach Saran field and the discovery of Eocene production below the regular Asmari limestone producing horizon in the Haft Kel field were the high points of 1938 activity. An increase of 16,510,000 bbls. in the withdrawals from the Haft Kel field was responsible for another increase in the total yearly production to 77,230,000 bbls. in 1938, compared to 76,590,000 bbls. in 1937. The production came from the sources indicated in the following table:

(To the nearest 10,000 bbls.)

Year	Masjid-I-Sulaiman	Haft Kel	Total
*1938	27,240,000	59,990,000	77,230,000
1937	33,110,000	43,480,000	76,590,000

*Production for December is estimated.

The pressure decline in the Masjid-I-Sulaiman field of three-tenths of a pound per square inch per 1,000,000 tons of net production remains about the same.

Only two new wells were drilled in the Masjid-I-Sulaiman fields during 1938. Other field work consisted of deepening existing wells. Anglo-Iranian Oil Co. expects to hold the production around 3,000,000 tons annually for an indefinite period.

Drilling north and west of Masjid-I-Sulaiman in the White Oil Springs area has revealed the presence of a separate structure and one producing well has been completed.

Two large wells were completed in 1938 in the Gach Saran field. At the end of the year this new important structure was proven for 20 miles along the strike and 5 miles at its widest point. Considerable work proceeds on survey for a pipe line from this field to the Persian Gulf Coast.

Exploratory work continued at Agha Jari, 55 miles southeast of Haft Kel and 70 miles northwest of Gach Saran. A deep test has indicated production at this point, although no details were disclosed in the review. On the Lali structure, 20 miles northwest of Masjid-I-Sulaiman, a test has penetrated 1,200 feet of Asmari limestone with only meager indications of production. At Pazanun, adjacent to and southeast of Agha Jari, two wells have encountered deep gas production, but further exploration is necessary to determine what oil potentialities may result.

HUNGARY and CZECHOSLOVAKIA

By Brandon H. Grove

Socony-Vacuum Oil Co., Inc.

Rapid development of the Budafa-Puszta field during 1938 advanced Hungary a long step toward petroleum self-sufficiency. Seven wells were completed at depths averaging 4,100 feet and there have been no failures. Initial production ranges from 150 to 400 bbls. Daily average now runs 1,400 to 1,800 bbls., equivalent to 33 per cent of Hungary's internal consumption. Production increased slightly from the government-controlled field at Bukkszek but the field is small. The government resumed exploratory drilling in Great Hungarian Plain east of the Danube. State wildcat tests are drilling at Nagybatony and at Mezokovesd.

Czechoslovakian developments were static. In the last months of the year the Apollo company succeeded in finding a southern extension to the Hodonin field which promises to bolster its failing production. The government-owned Gbely field production increased to some xetent.

Work was begun on the oil-mining project at Sokolnice, near Brno and at end of December a mine shaft had been sunk 120 feet. The shaft will be 260 feet when completed. Equipment is being installed for refining the oil sand as it is mined.

(Continued on Page 171)

Refinery Expansion

Pew Named Head of Refinery Group

Arthur E. Pew, Jr., of Sun Oil Co., Philadelphia Pa., has been appointed chairman of the American Petroleum Institute's 1939 committee on standardization of refinery equipment. R. P. Anderson, of the Institute staff, is secretary. Announcement of the appointments was made by N. E. Loomis, of Standard Oil Development Co., New York, chairman of the Institute's central committee on refinery technology.

Membership includes: C. C. Ashley, Shell Oil Co., San Francisco; D. G. Brandt, Cities Service Co., New York; L. L. Davis, Continental Oil Co., Ponca City, Okla.; A. J. Ely, Standard Oil Development Co., Elizabeth, N. J.; E. W. Gard, Union Oil Co. of California, Los Angeles; J. G. Glasgow, Gulf Oil Corp., Pittspurgh, Pa.; and L. M. Goldsmith, the Atlantic Refining Co., Philadelphia, Pa.; John S. Hess, Sinclair Refining Co., New York; K. V. King, Standard Oil Co. of California, San Francisco; W. D. Kinsell, Pure Oil Co., Chicago; R. C. Powell, Texas Co., New York; George W. Watts, Standard Oil Co. (Indiana), Chicago; H. F. West, Standard Oil Co. (Ohio), Cleveland, and M. P. Youker, Phillips Petroleum Co., Bartlesville, Okla.

Anglo-Canadian Adds Unit to Subsidiary's Plant

BRANDON, Manitoba.—The Anglo-Canadian Oil Co. of Calgary will proceed at once with installation of a cracking unit in the refinery of Central Refiners, Ltd., a local subsidiary, increasing its capacity from 750 to 2,500 bbls. a day. The refinery operates on Turner Valley crude.

Regina Plant Curtails Runs Of Turner Valley Crude

CALGARY, Alberta.—A telegram from R. V. Le Sueur, vice president of Imperial Oil, Ltd., to the McGillivray royal commission, announced that in view of competition of Illinois crude, the company would require 2,850 bbls. a day less of Turner Valley crude for its Regina, Saskatchewan, refinery.

Bay Petroleum Co. Expands and Includes New Personnel

The Bay Petroleum Corp., which heretofore has confined itself principally to the refining end of the oil industry, will expand its activities to crude oil production and later enlarge its marketing facilities, according to an announcement in Denver by Charles U. Bay, following a reorganization of the personnel of the company. Mr. Bay was elected president at a meeting of the directors to succeed M. H. Robineau, resigned. Roland V. Rodman, vice president, was made general manager, which office formerly was held by Mr. Robineau. Dent N. Hand was elected secretary to succeed H. E. Armitage, resigned. L. L. Leabo was made sales manager. The company operates refineries at Denver, Cheyenne, and McPherson, Kans. It owns proven acreage in Ellis County, Kansas. The Denver and Cheyenne refineries are operating on crude from the Lance Creek field in Wyoming, purchased from the Minnelusa Oil Corp. and transported through the Rocky Mountain Pipe Line Co. line recently built by the Continental Oil Co. It was stated that the company has sold additional common and preferred stock to the aggregate amount of $440,000. This stock was acquired mostly by Mr. Bay. Mr. Bay is senior partner of A. M. Kidder & Co., New York brokers; chairman of the executive committee of the First National Bank, of Bridgeport, Conn.; a director of the Rocky Mountain Pipe Line Co.; a director of Parke, Davis & Co., of Detroit, and identified with other large eastern concerns. The Denver refinery, it is reported, will shortly begin processing 1,000 bbls. daily of crude from the Lance Creek field for the California Co., if pending negotiations are consummated. This will be in addition to the company's own runs.

Hydrogenation Discussed

Before a large number of refinery engineers and technologists, A. Voorhies, Jr., research chemist and engineer for the Standard Oil Co. of Louisiana at Baton Rouge, described the application of hydrogenation to modern refining. The presentation was made in Tulsa last Friday evening at a meeting sponsored by the Tulsa Engineers Club. Extreme flexibility of the process was stressed and, based upon actual operations at the company's plant, results were enumerated when processing various charging stocks to make high-octane motor fuels, high viscosity-index lubricants and high-cetane number Diesel fuels.

May Move Cascade Refinery

The Cascade refinery, formerly operated at Reeds Switch in the East Texas field, is being torn down for reassembly in some other area. Tentative plans have been made by the owners to relocate the plant in the Centralia field of Illinois.

Natural Gasoline

Pressure Maintenance Program Planned for K.M.A.

WICHITA FALLS, Tex., Feb. 20.—A series of conferences during the week between K.M.A. producers and officials of Continental Oil Co. culminated Saturday in the announcement of plans for a pressure maintenance program for the K.M.A. field of Wichita County, North Texas.

The plan calls for Continental to operate the pressure plant in conjunction with its gasoline plant and return several million feet of gas daily now being wasted to the producing horizon. Sixty intake wells are to be utilized under the program. It is believed by the officials of the plan to be the largest pressure maintenance project of its kind undertaken.

K.M.A. now has about 930 oil wells covering 15,000 acres of productive land, and the program will heighten the recovery of oil and greatly lengthen the life of the field.

Seventy-five producers attended the conferences to assure complete coverage of the field. Those participating for Continental were E. O. Bennett, chief engineer; R. A. Colter, superintendent, and N. H. Shanahan, assistant general manager.

Robinson Named Chairman

W. W. Robinson, chief chemist of the production department, gasoline division laboratory of Texas Co. (California), has been appointed chairman of the California district Topical Committee on Materials of the American Petroleum Institute. Mr. Robinson was formerly chairman of the A.P.I. Special Sub-Committee on Oil Well Cements.

W. W. ROBINSON

Pipe Line Activity

Plan 100-Mile 8-Inch Line From Lloydminster Area

SASKATOON, Saskatchewan.—The Saskatoon City Council has approved a 20-year exclusive natural-gas franchise to Walter F. Thorn and associates, and the project will be submitted to the ratepayers for final approval. The Thorn group is planning to pipe natural gas from the Lloydminster field in West Central Saskatchewan, where Franco Oils, of which Mr. Thorn is manager, has an interest in four producing wells aggregating 47,000,000 feet a day open flow. Additional drilling will be undertaken in this area, where a test can be carried to the producing horizon in about six weeks at a cost around $10,000.

In addition, the Thorn interests have been operating in conjunction with Vera Oilfields, Ltd., in the Vera-Unity area, where commercial gas production was developed some time ago in Vera Oilfields No. 1

The Saskatoon project involves the laying of an 8-inch line upwards of 100 miles at an estimated cost of $4,500,000, this including installations of distribution. It is expected gas will be supplied to communities convenient to the transmission line, and the line may later be extended to serve the cities of southern Saskatchewan. Minneapolis and New York capital is reported interested. J. K. Swanson, formerly connected with Canadian Western Natural Gas Co of Calgary, will be general manager of the system. It is expected that Saskatoon will take approximately 10,000,000 cu. ft. a day.

Pipe Line Completed for Meridian-Crews Field

A pipe line connecting the Meridian, or Crews oil field of eastern Logan County, Oklahoma, with the Empire pipe line, 6 miles north, has been opened, giving the field its first outlet since the Fort Smith & Western Railroad discontinued service last month.

Royalite Plans Improvement Of Its Calgary System

CALGARY, Alberta.—S. G. Coultis, pipe line manager of Royalite Oil Co., informed the royal commission now investigating the oil and gas industry in Alberta his company is planning to spend $263,000 this year in improving its Turner Valley-Calgary pipe line system. The company plans to install a $20,000 pumping station south of the Highwood River to handle anticipated crude production in that area and $48,900 on new tankage in Turner Valley and Calgary, including a 10,000-bbl. pressure tank at the Calgary terminal of the pipe line system for storage of naphtha and absorption gasoline. The present tanks of 200,000-bbl. capacity, will be used for crude storage.

Natural Gas News

Repressuring Discontinued In Bow Island Field

LETHBRIDGE, Alberta.—Repressuring of the Bow Island field with Turner Valley waste gas was discontinued on February 3, following notification from the Alberta Conservation Board that Turner Valley gas could no longer be used for the purpose. P. D. Mellon, superintendent of Canadian Western Natural Gas, Light, Heat & Power Co., states that if it is the board's intention to prevent further wastage from the Turner Valley gas cap, the plant will be disposed of; but if residual gas from oil production can be gathered and compressed, the company will consider extending operations.

Texas Commission Wins Technical Point

AUSTIN, Tex.—The Railroad Commission won a technical point in its long fight with Lone Star Gas Co. over power of the commission to exercise original jurisdiction in fixing retail gas rates.

The Supreme Court dismissed for want of jurisdiction the appeal of Community Natural Gas Co., subsidiary of Lone Star, from a decision of the Dallas Court of Civil Appeals which had set aside a temporary injunction by a Dallas district court restraining the commission from instituting a rate investigation and hearing at Trenton, and had held Travis County courts had exclusive jurisdiction in suits attacking rate orders of the commission on their face.

The effect was to leave standing the judgment of the court of civil appeals. There was no decision in the court of civil appeals or in the Supreme Court on the matter of original jurisdiction of the commission in rate investigations.

The gas company contends the commission has power only to exercise appellate jurisdiction.

Southwestern Gas Measurement Short Course Committee

The executive committee of the Southwestern Gas Measurement Short Course met at the University of Oklahoma, Norman, to make plans for the 1939 school.

L. G. Rheinberger, Sinclair Prairie Oil Co., Tulsa, general chairman,, presided during the morning session, and Fay C. Walters, Panhandle Eastern Pipe Line Co., Kansas City, Mo., chairman of the program committee, presided in the afternoon.

The dates for this year's short course were set for April 18, 19, and 20.

Other members of the executive committee are: Dean W. H. Carson, University of Oklahoma, chairman of banquet, entertainment, and local arrangements committee; R. D. Hanley, Magnolia Petroleum Co., Dallas, Tex., chairman publications committee; R. L. Rountree, United Gas Pipe Line Co., Houston, Tex., chairman exhibits committee; Earl Kightlinger, Arkansas-Louisiana Gas Co., Shreveport, La., chairman of practical methods committee; and Miss Kate A. Niblack, Oklahoma Utilities Association, chairman of registration and publicity committee.

Other members are: E. M. Myers, Oklahoma Corporation Commission; J. H. Page, Kansas Corporation Commission; E. H. Poe, secretary of Natural Gas Section of the American Gas Association, New York; William F. Lowe, secretary Natural Gasoline Association of America, Tulsa; J. H. Satterwhite, American Meter Co., Tulsa; W. R. McLaughlin, Pittsburgh Equitable Meter Co., Dallas, Tex.; G. B. Lane, Foxboro Co., Dallas, Tex.; Max K. Watson, Canadian River Gas Co., Amarillo, Tex.; C. A. Gibson, Cities Service Gas Co., Bartlesville, Okla.; G. W. McCullough, Phillips Petroleum Co., Bartlesville; and R. M. Scofield, Lone Star Gas Co., Dallas, Tex.

The next meeting of the general committee will be held in Tulsa, March 13, when Mr. Walters will present the program for approval.

George B. Bunn Heads A.P.I. Natural Gas Group

George P. Bunn, Phillips Petroleum Co., Bartlesville, Okla., has been appointed 1939 chairman of Group 2, subcommittee on natural gas (wet or dry), of the American Petroleum Institute Division of Production central committee on measuring, sampling, and testing natural gas and natural gasoline.

Membership of Group 2 and its subcommittees include: M. A. Abernathy, Union Producing Co., Houston, Tex.; M. J. Adams, Texas Co., Fort Worth, Tex.; W. B. Berwald, Bureau of Mines, Bartlesville, Okla.; G. H. Bollman, Sun Oil Co., Dallas, Tex.; G. M. Davidson, Natural Gas Pipe Line Co. of America, Chicago; Gilbert Estill, Oklahoma Natural Gas Corp., Tulsa; F. D. Frank, Cities Service Gas Co., Bartlesville, Okla.; W. F. Fulton, Union Producing Co., Houston, Tex.; M. L. Haider, Standard Oil Development Co., New York; Earl Kightlinger, Arkansas Louisiana Gas Co., Shreveport, La.; E. C. LeFevre, Cities Service Oil Co., Bartlesville, Okla.; W. H. Meier, Atlantic Refining Co., Dallas, Tex.; and E. L. Rawlins, Union Producing Co., Houston, Tex.

W. E. Reardon, Columbian Gasoline Corp., Monroe, La.; G. B. Reece, Southern Counties Gas Co., Los Angeles, Calif.; L. G. Rheinberger, Sinclair Prairie Oil Co., Tulsa; F. M. Seibert, Gulf Oil Corp., Houston, Tex.; Don Sillers, Lone Star Gas Co., Dallas, Tex.; J. B. Taylor, Signal Oil & Gas Co., Los Angeles, Calif.; R. D. Turner, Skelly Oil Co., Tulsa; P. G. Weidner, Stanolind Oil & Gas Co., Tulsa; D. E. West, Magnolia Petroleum Co., Dallas, Tex.; D. C. Williams, Continental Oil Co., Ponca City, Okla.; B. G. Williams, Southern California Gas Co., Los Angeles, Calif.; D. M. Wolfe, Standard Gasoline Co., San Francisco, Calif.; and William Young, Texas Co., Los Angeles, Calif.

Subcommittee 2-A — Analysis: Chairman, D. M. Wolfe, Standard Gasoline Co., San Francisco; G. M. Davidson, Natural Gas Pipe Line Co. of America, Chicago; E. L. Rawlins, Union Producing Co., Houston, Tex.; and W. A. Simkins, Phillips Petroleum Co., Bartlesville, Okla.

Subcommittee 2-B — Gas Measurement: Chairman, Don Sillers, Lone Star Gas Co., Dallas, Tex.; G. H. Bollman, Sun Oil Co., Dallas, Tex.; F. D. Frank, Cities Service Gas Co., Bartlesville, Okla.; Earl Kightlinger, Arkansas Louisiana Gas Co., Shreveport, La.; W. E. Reardon, Columbia Gasoline Corp., Monroe, La.; D. E. West, Magnolia Petroleum Co., Dallas, Tex.; D. C. Williams, Continental Oil Co., Ponca City, Okla.; and D. M. Wolfe, Standard Gasoline Co., San Francisco.

Subcommittee 2-C—Sampling, etc.: Chairman, B. G. Williams, Southern California Gas Co., Los Angeles, Calif.; M. A. Abernathy, Union Producing Co., Houston, Tex.; E. L. Rawlins, Union Producing Co., Houston, Tex.; and G. B. Reece, Southern Counties Gas Co., Los Angeles, Calif.

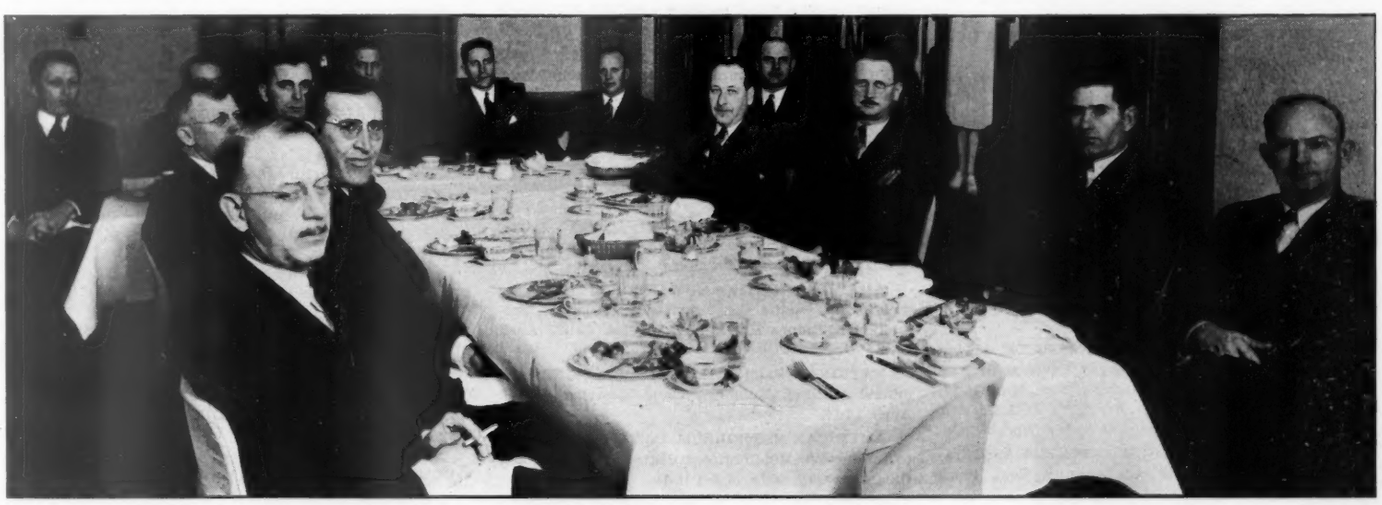
Subcommittee 2-D—Forms: Chairman, R. D. Turner, Skelly Oil Co., Tulsa; Gilbert Estill, Oklahoma Natural Gas Corp., Tulsa; and B. G. Williams, Southern California Gas Co., Los Angeles, Calif.

Subcommittee 2-E — Gasoline Content of Natural Gas: Chairman, E. C. LeFevre, Cities Service Oil Co., Bartlesville, Okla.; W. F. Fulton, Union Producing Co., Houston, Tex.; M. L. Haider, Standard Oil Development Co., New York; L. G. Rheinberger, Sinclair Prairie Oil Co., Tulsa; F. M. Seibert, Gulf Oil Corp., Houston, Tex.; P. G. Weidner, Stanolind Oil & Gas Co., Tulsa; and William Young, Texas Co., Los Angeles, Calif.

Subcommittee 2-F—Open Flow Testing of Gas Wells: Chairman, W. B. Berwald, Bureau of Mines, Bartlesville, Okla.; M. J. Adams, Texas Co., Fort Worth, Tex.; and F. D. Frank, Cities Service Gas Co., Bartlesville, Okla.

Northwestern Ohio Towns To Have Natural Gas

Consumers in seven northwestern Ohio towns will have natural gas by August 1 instead of October, Ohio Gas Light & Coke Co. officials announced, so the change over in appliances can be made in warm weather. The towns of Bryan, Stryker, Edgerton, Wauseon, Archbold, Montpelier, and Napoleon will be supplied from the Texas-Detroit pipe line. The manufactured gas plant at Bryan will be maintained as emergency equipment.



J. H. Satterwhite, G. B. Lane, C. A. Gibson, Gilbert Estill, R. L. Rountree, J. H. Page, Fay C. Walters, L. G. Rheinberger, Dean W. H. Carson, D. A. Sillers, W. R. McLaughlin, Max K. Watson, Earl Kightlinger, and R. M. Scofield, of Southwestern Gas Short Course Committee

Programs and Meetings

A.C.A. Oklahoma Section Petroleum Group Dates

The petroleum group of the Oklahoma section of the American Chemical Society will hold a meeting in the Barnsdall Oil Co. office at Barnsdall, Okla., at 3 p.m., February 25, to discuss the general subject of chemistry in uses of petroleum derivatives, concluding with a dinner at 6 p.m.

On the evening of March 18 the same group will be addressed in Tulsa by Wright Gary, of M. W. Kellogg Co., on "Catalytic Refining, Reforming and Polymerization."

Chicago Oil Men's Club Elects New Officers

The new officers of the Chicago Oil Men's Club for the year 1939 are William G. Franke, American Mexican Petroleum Corp., president; Harry Lightstone, Kanotex Refining Co., vice president; Charles J. Wood, Harry P. Dunn Co., secretary, and Carl H. Saas, Refiners Petroleum Co., treasurer.

New directors are Charles P. Hirth, last year's president, and Roy J. Thompson, Apex Motor Fuel Corp Mr. Hirth is with Hughes Oil Co. Other directors are Holgar Jensen, Spencer Petroleum Co.; Harry Hough, A. & A. Oil Co., and J. Glen Phinney, Cities Service Oil Co.

At the first meeting of the Chicago Oil Men's Club, January 19, the following committees were appointed: Finance: H. P. Brady, chairman; H. G. Donovan, F. E. Dolezal, W. L. Henry, J. S. Schurman. Entertainment: O. R. Waller, chairman; F. B. Caldwell, G. N. Olson, P. R. Girard, A. L. Cummings. Publicity: E. L. Barringer, chairman; E. V. Perkins, B. E. Rourke. House: E. J. Walters, chairman; C. J. Murphy, J. E. Messler. Membership: R. S. Brennan, chairman; A. J. Callaghan, C. E. Eberle, K. H. Ward, K. F. Holdefer, J. T. McDowell, H. G. Plane, T. E. Rolf, R. G. Satterley.

New members whose applications were accepted were J. J. Tumpeer and S. Seligman, Wishnick-Tumpeer Corp.; S. E. Neilsen, Pure Oil Products Co.; C. R. Jonswold, Triangle Oil Co.; and A. S. Owens (associate member), Erie Meter System, Inc.

Eastern District Meets At Pittsburgh in April

D. T. Ring, of Ohio Fuel Gas Co., Columbus, Ohio, has been appointed chairman of the program committee which is developing plans for the spring meeting of the Eastern District of the American Petroleum Institute Division of Production to be held in the William Penn Hotel at Pittsburgh, Pa., April 4 and 5.

John A. Thompson, of Belmont Quadrangle Drilling Corp., Bradford, Pa., is chairman of the registration committee. T. H. Myers, of Carnegie Natural Gas Co., Pittsburgh, is chairman of the committee on arrangements.

Other members of the program committee include O. W. Van Petten, of Columbian Carbon Co., Charleston, W. Va., and J. J. Schmidt, of East Ohio Gas Co., Cleveland, Ohio.

J. C. Fervoy Heads Skelly Employes Association

J. C. Fervoy, in charge of forecasts for Skelly Oil Co., was elected president of the Skelly Employes Association, recently organized by workers in the Tulsa offices. He has been a Skelly employe for 16 years. Other officers include Mildred Thomas, calculating department, vice president, and Paul C. Bray, purchasing department, secretary-treasurer. Members of the board of trustees are Iona Dripps, Mary Brooks, Elizabeth Finney, Lou Vada Olson, Bessie Zoller, Mary Williams, Ruth Smith, E. P. Lane, J. E. Webb, Ward Shaver, H. L. McKeen, R. W. Robson, P. Q. Proctor, P. J. Patten, L. E. Burnett, W. R. Spindell, George Skalsky and Henry Evans.

President to Invite Foreign Companies to Houston Show

A joint resolution authorizing the president to invite the states of the union and foreign countries to participate in the Oil-World Exposition at Houston, Tex., April 24 to 29, inclusive, has been introduced in the House at Washington, by Congressman Albert Thomas of Texas. This resolution provides that articles imported for exhibition at the Oil-World Exposition, or for use in constructing, installing, or maintaining foreign buildings or exhibits be admitted duty free.

Michigan Oil and Gas Exposition To Be Held August 1-6

The fourth Michigan Oil and Gas Exposition for the eastern states will be held at Mount Pleasant, Mich., August 1-6. H. B. Lidstone, secretary, announces that requests for space have justified the erection of another building.

At the conclusion of the third Michigan Oil and Gas Exposition in 1937 the exhibitors and executive officials voted to hold the Oil and Gas Exposition for the eastern United States every other year, on the off year of the Tulsa show.

Conference at Washington On Marketing Issue

The refining and marketing practices committee of the Independent Petroleum Association of America announces a conference will be held at Washington, February 23, between Director George McCorkle of the trade practice conferences of the Federal Trade Commission, and the committee from the petroleum industry which originally submitted a marketing code consisting of Wilmer R. Schuh, president, National Association of Petroleum Retailers; C. E. Arnott, vice president, Socony-Vacuum Corp., and Paul E. Hadlick, secretary, National Oil Marketers Association.

CALENDAR

February

AMERICAN SOCIETY OF MECHANICAL ENGINEERS AND LOUISIANA ENGINEERING SOCIETY, joint meeting, St. Charles Hotel, New Orleans, La., Feb. 23-25.

AMERICAN CHEMICAL SOCIETY OKLAHOMA SECTION, petroleum group, Barnsdall, Okla., February 25.

NORTH TEXAS OIL AND GAS ASSOCIATION, annual meeting, Wichita Falls, Feb. 25.

NATIONAL ASPHALT CONFERENCE, Los Angeles, Calif., week of February 27.

March

AMERICAN SOCIETY FOR TESTING MATERIALS, committee week and regional meeting, Deshler-Wallick Hotel, Columbus, Ohio, Mar. 6-10.

INTERNATIONAL ACETYLENE ASSOCIATION, 39th annual convention, Houston, Tex., Mar. 8-10.

WELDING CONFERENCE AND SHORT COURSE, University of Oklahoma, Norman, Okla., Mar. 9-10.

AMERICAN PETROLEUM INSTITUTE, spring meeting of Southwestern District Division of Production, Plaza Hotel, San Antonio, Tex., Mar. 16-17.

AMERICAN CHEMICAL SOCIETY OKLAHOMA SECTION, petroleum group, at Tulsa, March 18.

WESTERN PETROLEUM REFINERS ASSOCIATION, annual meeting, San Antonio, Tex., Plaza Hotel, Mar. 20-22.

SOCIETY OF EXPLORATION GEOPHYSICISTS, annual meeting (joint meeting with A.A.P.G. March 22), Oklahoma City, Huckins Hotel, March 21-23.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, 24th annual meeting, Skirvin Hotel, Oklahoma City, Okla., Mar. 22-24.

April

AMERICAN CHEMICAL SOCIETY, Baltimore, Md., April 3-7.

AMERICAN PETROLEUM INSTITUTE, spring meeting of eastern district, Division of Production, William Penn Hotel, Pittsburgh, Pa., April 4-5.

AMERICAN PETROLEUM INSTITUTE, spring meeting of Pacific Coast district, Division of Production, Biltmore Hotel, Los Angeles, Calif., April 11.

NATIONAL PETROLEUM ASSOCIATION, semi-annual meeting, Hotel Cleveland, Cleveland, Ohio, April 13-14.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Mid-Continent district, Skirvin Hotel, Oklahoma City, Okla., April 18-19.

OIL-WORLD EXPOSITION, Houston, Tex., April 24-29.

May

PETROLEUM ELECTRICAL SUPPLY ASSOCIATION AND PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Rice Hotel, Houston, Tex., May 2-4.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Hotel Tulsa, Tulsa, Okla., May 3-4-5.

AMERICAN PETROLEUM INSTITUTE, ninth midyear meeting, Roosevelt Hotel, New Orleans, La., May 15-18.

NATURAL GAS SECTION, A.G.A., annual meeting, Tulsa, May 8-11.

WORLD AUTOMOTIVE ENGINEERING CONGRESS, sponsored by S.A.E. for New York (May 22-26), Indianapolis (May 20), Detroit (May 31-June 2), San Francisco (June 6-8), May 22-June 8.

NATIONAL ASSOCIATION OF PURCHASING AGENTS, annual convention (Oil Company Buyers' Group), Fairmont Hotel, San Francisco, Calif., May 21-25.

June

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, Hotel Hershey, Hershey, Pa., June 15-16.

THIRTEENTH INTERNATIONAL CONGRESS OF CARBIDE, ACETYLENE, OXYACETYLENE WELDING AND ALLIED INDUSTRIES, Munich, Germany, June 25-July 1.

August

MICHIGAN OIL AND GAS EXPOSITION, Mount Pleasant, Mich., Aug. 1-6.

ENGINEERING and OPERATING

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FEBRUARY 23, 1939

HIAWATHA WILDCAT NEAR CORPUS CHRISTI COMBATS HEAVING SHALE
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The measures taken to fight heaving shale in drilling a deep well on the Gulf Coast with a specially designed mud system.

RECYCLING PROJECT PROPOSED FOR THE JOAQUIN FIELD, EAST TEXAS
By George Weber ..... *Page 62*

A plan has been submitted to producers in an East Texas field which aims to maintain formation pressure to obtain larger recovery.

SAFETY—BENT GIRT MAKES DERRICK DANGEROUS ..... *Page 64*

Adapting a production derrick for drilling in the shallow Illinois fields requires that provision be made for the demands of this type of service.

ATLANTIC REFINING COMPANY'S PLANT ON THE GULF COAST, TEXAS
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One of the latest additions to the refineries at Port Arthur, Tex., embraces five special types of distilling operation.

SOUND CONSERVATION MEASURES AIDING IN SCHULER OIL RECOVERY
By George Weber ..... *Page 86*

Cooperation between the Arkansas Oil and Gas Commission and operators in the field brought the adoption of conservation measures.

IMPROVEMENT IN TOOL JOINTS DECREASES THE PIPE BREAK-OFFS
By Harry F. Simons ..... *Page 90*

To eliminate failures occurring in the last engaged thread of tool joints, cooperative effort has been made on the part of manufacturers and contractors. In discussing the changes which have been introduced, the author gives special attention to the service conditions.

GAS INJECTION AND NATURAL GASOLINE PLANT OPERATION
By Henry N. Wade ..... *Page 98*

A review is presented of what is to be observed where gasoline plants are operated in connection with pressure maintenance or repressuring projects; this deals with the effect on the quality and quantity of wet gas, life of plant operation, and plant design.

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Hiawatha Wildcat Near C

Combats Heaving Shale

By NEIL WILLIAMS

CORPUS CHRISTI, Tex.—Drilling without mishap through more than 3,600 feet of heaving shale from 4,000 feet to below 7,600 feet, through which casing was run and cemented without trouble, and then carrying the hole to a total depth of 10,015 feet, is the feat accomplished by Hiawatha Oil & Gas Co. in its No. 2 Roemer, wildcat test, 6 miles south of Port Lavaca, Calhoun County, Texas Gulf Coast. To climax the undertaking, the well gave indications of opening another Gulf Coast field. From sand at 7,815-90 feet, below the bad shale, and through which liner was run and perforated at various levels for a succession of tests, the well swabbed a small amount of oil. However, since then, the well has been shut down.

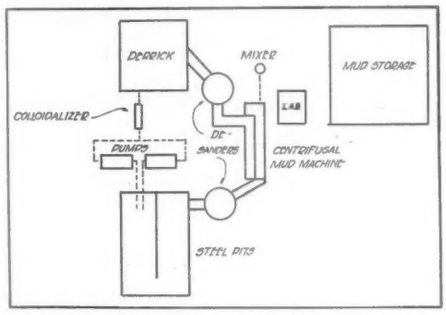
Development of Area

A string of 9 ⅝-inch casing was run through the shale section. It was cemented at 7,615 feet, just below the bottom of the shale, with 800 sacks of cement. This string had approximately 4,000 feet of 54-pound pipe on bottom to well above the top of the troublesome shale, with the remainder being 43-pound material.

Location of the well is in what is regarded as one of the worst heaving shale areas on the Gulf Coast. It is just north of the Seadrift prospect, where Continental Oil Co. encountered so much trouble with heaving shale, in a series of four deep tests undertaken from 1934 to 1936. The present well, located a little over a mile north of the most northeasterly of the Continental, was the second for Hiawatha, the first (2,250 feet southeast), having been junked and abandoned in the shale after being able to get only to 8,374 feet. The second well was drilled under contract by Al Buchanan Drilling Co. of San Antonio with Bruce Cassady as superintendent. Mud conditioning, a phase of operation which received particular attention, was under the direction of Kennedye Well Engineers, Inc., of Houston. Hugh Sullivan, manager of Hiawatha Oil & Gas Co., Corpus Christi, was constantly in general charge of the work.

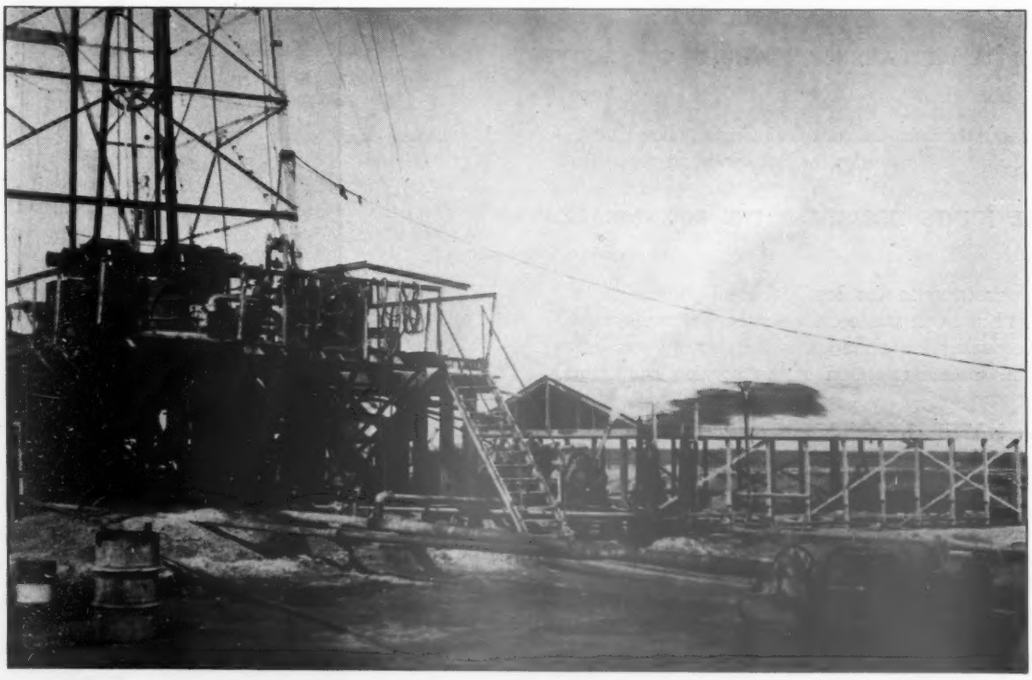
Mud System

One of the most completely equipped mud systems ever installed on any Gulf Coast well was provided. It was planned and laid out to make, and continuously keep drilling mud free of sand, shale particles, or entrained gas or air, with a minimum free water content. Facilities included steel flow ditches, two de-sanders, a centrifugal mud machine, a steel thermosyphon slush pit, proportional mud mixer, de-gasser, and a colloidalizer, together with detail pits for wash water, pump water, rejected mud, and reserve mud. The slush pit was covered to prevent water contamination from rain or other outside sources. There was a permanent mud house, as well as a complete mud testing laboratory and control house. The latter was located about 30 feet from the derrick, midway between the mud machine and suction pits, and convenient to the mud stream. The location of this was such that not only could samples be taken quickly and frequently for testing, but all operations around the rig could be watched closely.



Mud system on Hiawatha Oil & Gas Co. No. 2 Roemer, Calhoun County, Texas

From the control house, any changes in viscosity, salt water content, gas or air entrainment could be noted readily, and proper counteracting treatment applied.



Hiawatha Oil & Gas Co. No. 2 Roemer, wildcat test, Calhoun County, Texas Gulf Coast, showing portion of rig and covered mud pits

The shale encountered in the troublesome zone was of a greenish color, cuttings varying in length from 1 to 1½ inches, and in thickness from ¼-inch to as much as an inch. The lower section was composed of slightly darker greenish color. Small sections of bentonite were encountered throughout the shale body, this being from 94 to 96 per cent pure bentonite by the swelling test. Drilling mud was made from the shales drilled. Through the trouble zone weight of this was maintained around 10.2 pounds and viscosity around 22 seconds. Weighing materials were added while drilling through the gas sands encountered below the shale section. Although no trouble was experienced with the shale itself, some boiler trouble was occasioned due to the saline water that had to be used. This water, used both for boilers and the mud system, tested 176 grains per gallon. Condensers and evaporators were used by operators, and chemical treatment was applied; concentration of salt was so great that frequent boiler shutdowns were necessitated.

Significant is the fact that while drilling through the shale there

r Corpus Christi e Successfully

were occasional shutdowns, in which the pipe hung without circulation, indicating that continuous circulation is not essential in drilling heaving shale. In the bad shale section there was one shutdown of 5 days, another for 3 days, a third for 48 hours, one for 18 hours and one for 11 hours. The 48-hour shutdown was because of a twistoff that occurred between the 6-inch and 4-inch, the string being made up of a long drill collar, two joints of 6-inch, and a sub from 6 inches to 4 inches. The mud was kept in such condition that an overshot picked up the drill collar with the two joints of 6-inch and the bit the first trial, and only four points of weight were pulled on the weight indicator. In view of the difficulty of retrieving a drill collar, this is regarded as an interesting feat.

Steel Slush Pit

While drilling through the troublesome zone a circulating head was available but it was not found necessary to use it, as the hole took mud at all times while pulling pipe. However, it proved of great benefit at lower depths when the temperature increased in the hole. While drilling below 9,000 feet, the circulator was used when coming out of hole at all times until the pipe was in the casing, which as stated was set at slightly below 7,600 feet. The steel slush pit is of a type that embodies the fundamental principles used in mineral classification; this makes use of hydraulic separation, hindered settling and the thermosyphon principle used in mineral classification. Through its operation, with the other equipment, it was possible to carry less than 1 per cent sand in the mud, even when drilling through surface formations. The small per cent carried to the pump was classified as floating sand under 200-mesh.

An accompanying flow chart shows the layout of the mud system. The position of the proportional mixer was such that additional weighing material not only would be thoroughly mixed in the proportional mixer itself, but would have to go through the centrifugal mud machine, thence to the desander, the thermosyphon tank, and through the pumps and colloidalizer before entering the well. By this method it is possible to produce an absolutely stable mixture of any desired weight at all times in one cycle.

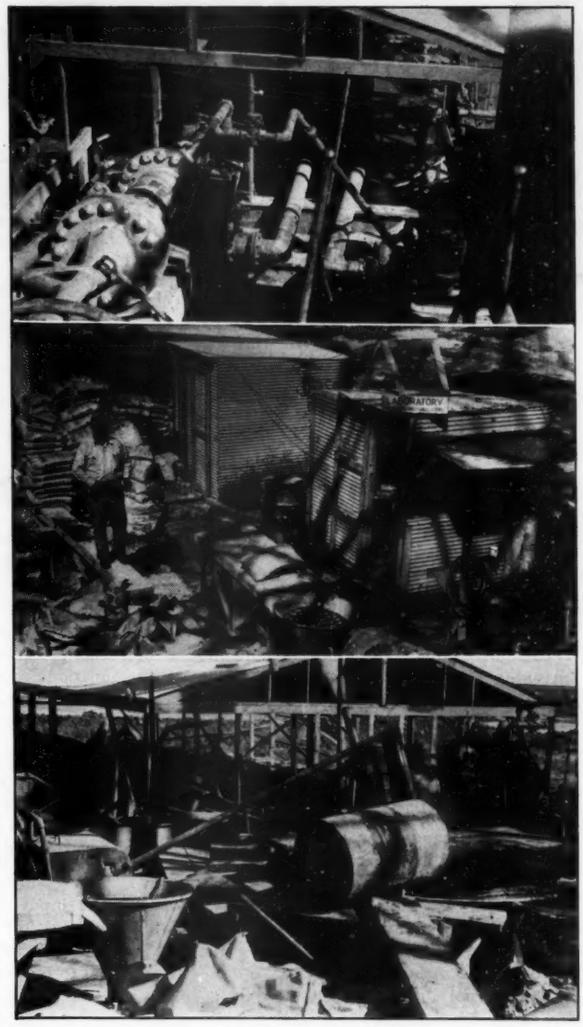
The colloidalizer was intended to create an intimate submicroscopic mixture of the native cuttings, breaking the jell strains, and thus lowering the viscosity of the fluid before it entered the well. Colloidal content of the mud when going through the troublesome shale averaged around 21 per cent.

In the system, the mud from the well entered one of the de-sanders, circulating through a series of baffles so as to leave the majority of shale, gravel and sand in the unit before entering the centrifugal mud machine. A second de-sander of the same size and type was used to trap any small amounts of sand which passed through the 60-mesh screen.

The centrifugal mud machine served to make colloidal mud from the native cuttings, screen particles to 60-mesh, lower the viscosity and remove the gas. A standby de-gasser was available but was not used as all entrained gas was removed in the mud machine. It was found tthat the weight of the mud was increased from 1 pound to as high as 1.4 pounds through the machine.

Of particular interest is the fact that the well was drilled without any unusual assembly of equipment, other than the special mud-making facilities. In the rig assembly were two 18-inch pumps with 6⅜-inch liners, one of which served as a standby most of the time; four 125-hp., 300-pound working pressure boilers; a 12 by 12 steam engine, with other units of corresponding size.

Another well is expected to be started immediately upon completion of this hole. The company has an almost solid block of approximately 30,000 acres around the well, and will be able to carry out a consistent and conservative development program. The block was assembled during 1936 on the strength of seismic exploration by McCollom Exploration Co.



(Upper) Looking down from derrick floor on mud pits showing hook-up of pumps and special colloidalizer. (Center) Mud house, laboratory and control house with Bruce Cassady, superintendent for Al Buchanan Drilling Co. (Lower) Portion of mud system showing covered mud pit, and portion of mud mixing machine at left

W. R. Campbell, land man, Benedum-Trees interests; Claxton Benedum; Lewis Lawler, independent producer; Darwin Benedum, all of San Antonio, Tex.; W. L. McAndlis, Hollywood, Calif., Gulf Coast royalty owner, and C. B. Kennedye

Welding Practices

Welding in Europe, according to C. H. Jennings, of the Westinghouse Electric & Manufacturing Co., has grown to be as important a tool in engineering as it is in the United States. Welding machines in Europe are of high quality and in most countries the use of a.c. equipment far surpasses the use of d.c. equipment. Special attention has been directed to low rating machines for thin-gauge welding with the consequence that very excellent a.c. and rectifier type sets have been developed for this work. Welding electrodes in Europe are primarily of the shielded-arc type although considerable quantities of bare and light dipped electrodes are still in use in Germany and France. Spot and other types of resistance welding are not in as common use as they are in America. There is a great interest in this method of welding, however, particularly for automobile, aircraft and railway construction. Auto manufacturers are at the present time considering installation of tube controlled equipment.

Recycling Project Proposed for Joaquin Field

By GEORGE WEBER

Plant is designed to permit expansion by adding to existing sections of first unit operating in the field. Additional boilers will be installed at the far end of this boiler house, now containing four units

A pressure maintenance plan with far-reaching possibilities for conservation is under consideration in the Joaquin field of East Texas. Providing the four-fold advantages of increased recovery of oil and condensate, reduced lifting costs, elimination of gas waste and curtailed drilling investment, the plan, if adopted, will comprise a model conservation project.

In most fields where repressuring or pressure maintenance has been undertaken, the facilities for conserving the reservoir energy have been added after production was developed. At Joaquin the reverse is true, for the field just entering commercial production, a modern gasoline extraction and repressuring plant is already in operation. This offers an unparalleled opportunity for effecting a cooperative production plan along the lines of strict conservation.

The Portex Oil Co., which holds considerable acreage on the Joaquin structure is now operating at full capacity, a new high-pressure gasoline extraction and gas repressuring plant in the field. At the present time, the plant comprises the first unit of a project which will be enlarged as the field is developed. The present capacity of 20,000,000 cu. ft. per day is adequate to care for all current production.

Operating on the recently developed technique of gasoline extraction from gas in the pressure range of retrograde condensation, the plant incorporates advanced operating features. Gas from the high pressure wells is moved to the plant in high-pressure lines, and subjected to pressure reduction in stages. With the gasoline extracted. the lean gas is charged to a 600-hp. angle-type compressor, where it is boosted to a pressure sufficient to return it to the reservoir.

The Portex Oil Co. owns three producing wells in the field at the present time. Two of them are used as producing wells, and the third as an input well. The wells, producing from the lower Glen Rose formation below 5,000 feet, have closed-in pressures of 2,450 pounds per square inch. The input well has a potential production well in excess of the 20,000,000 cu. ft. capacity of the plant, assuring successful return of the gas to the formation.

A fourth well, Redditt & Gray No. 2 Pickering Lumber Co. was recently completed in the field. It is located about 1,000 feet west of one of the Portex wells, and, like them, is classed as a gas-distillate well. Its initial production was 3 bbls. per hour of brown distillate and 7,000,000 cu. ft. of gas daily, and a later gauge showed the well capable of making 11 bbls. per hour together with 40,000,000 cu. ft. of gas daily. This well produced for several weeks at an extremely high gas-distillate ratio but is now shut down by orders of the Texas Railroad Commission.

An important development at Joaquin is indicated in the new well. The test showed signs of oil, and it is believed that by deepening it can be converted into a crude producer. This alters the outlook for development of the pool, which is currently classed as a gas field.

The probability of finding oil production down-dip on the Joaquin structure is coupled with another point which must be considered at the present time. The true extent of the field is not known, but indications point to the possibility that the productive area may extend across the state line into Louisiana. Supporting this conjecture is the showing in a well drilled about 4 miles northeast of the town of Logansport, La., and about 6 miles northeast of the present Joaquin field production. The Hunter Co. No. 1 Parker, drilled several months ago, encountered a broken gas sand at 4,953-5,029 feet in the same formation producing at Joaquin, and was completed for an initial production of 4,250,000 cu. ft. of gas together with distillate. The closed-in pressure on the well is 2,425 pounds, corresponding to the reservoir pressure in the wells at Joaquin.

If the Hunter well is located on the same structure as the wells in Shelby County, Texas, the field will be of considerable size, and will extend across the Texas-Louisiana state line.

In view of the possibility of crude production at Joaquin and the indicated size of the producing structure, the necessity for a pressure maintenance plan is considerably enhanced. Such a plan, adopted before the complications of subsequent development have presented themselves, will result in increased benefits to all concerned.

Accordingly, the Portex Oil Co. is submitting to all interested parties, a plan which incorporates the following aims:

1. To maintain the original formation pressure as long as possible.
2. To secure the greatest ultimate total recovery from the field.
3. To reduce to a minimum the lifting cost.
4. To protect the interests of all concerned including those of the two states by intelligently applying proven principles in oil production technique.

With the established facilities already in operation, the Portex company proposes to undertake pressure maintenance for the entire field as it develops. Under this plan, the company will gather all gas produced, whether with oil or distillate, processing it in the plant, and recom-

The Portex plant is located in approximately the geographical center of the field. Pump house and laboratory in foreground, compressor shed in background

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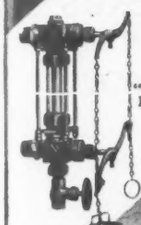
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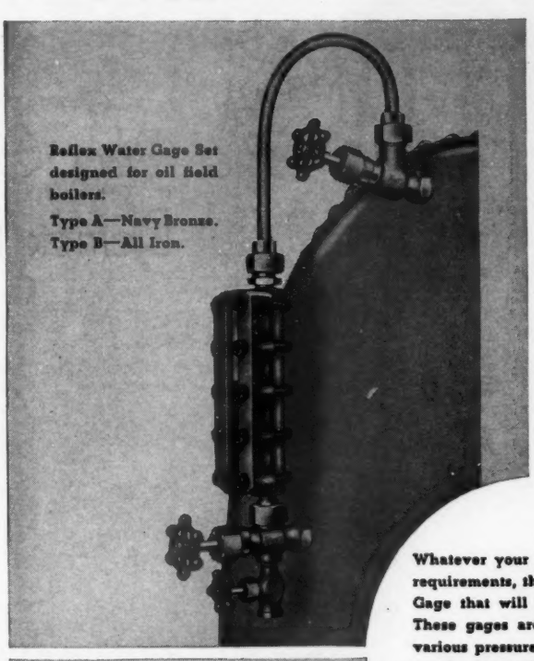
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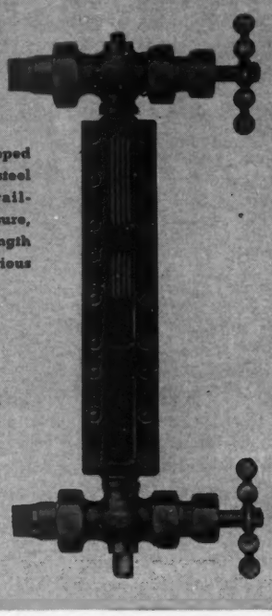
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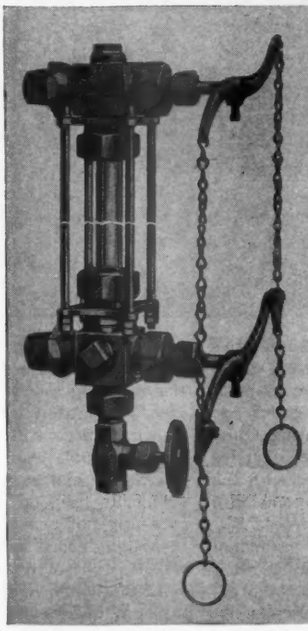
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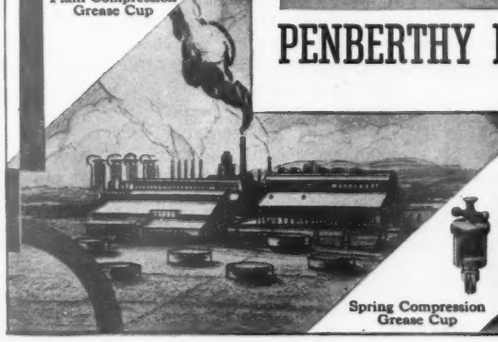

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pressing it for return to the individual leases and the producing formation. The gas taken at the plant will be gathered after all possible crude and condensate has been removed in the individual well separators. Processing this gas will result in the recovery of a condensate fraction, which, under ordinary production methods is lost when the gas is flared.

The principal point for conservation, however, entails the benefits derived from maintenance of the reservoir pressure. Production of a crude well at the allowed gas-oil ratio of 2,000 cu. ft. per barrel results in the voiding of much excess reservoir space. Without repressuring the allowable gas production at the above ratio, an estimated 14 cu. ft. of reservoir space would be voided by the gas alone. The oil produced with the gas would void approximately 6 cu. ft. Then, under ordinary production practices, it is seen that for every barrel of oil produced, the reservoir pressure decline is affected in the following ratios:

1. One-third to one-fifth from actual oil production.

2. Two-thirds to four-fifths from permitted gas wastage.

Thus it may be conservatively estimated that the benefit of pressure maintenance will provide for an increase in ultimate recovery in excess of 50 per cent over the expected total under ordinary producing methods.

In addition to the recovery of condensate fractions otherwise wasted and the augmented crude recovery, the overall lifting cost of crude for the life of the field should be seriously considered. Without return of the gas to the reservoir, it is estimated that about 60 per cent of the field production will flow, giving a remaining 40 per cent which must be artificially lifted. At a lifting cost of 20 cents per barrel from 5,000 feet after flush production has ceased, the average lifting cast for all oil would be about 8 cents per barrel.

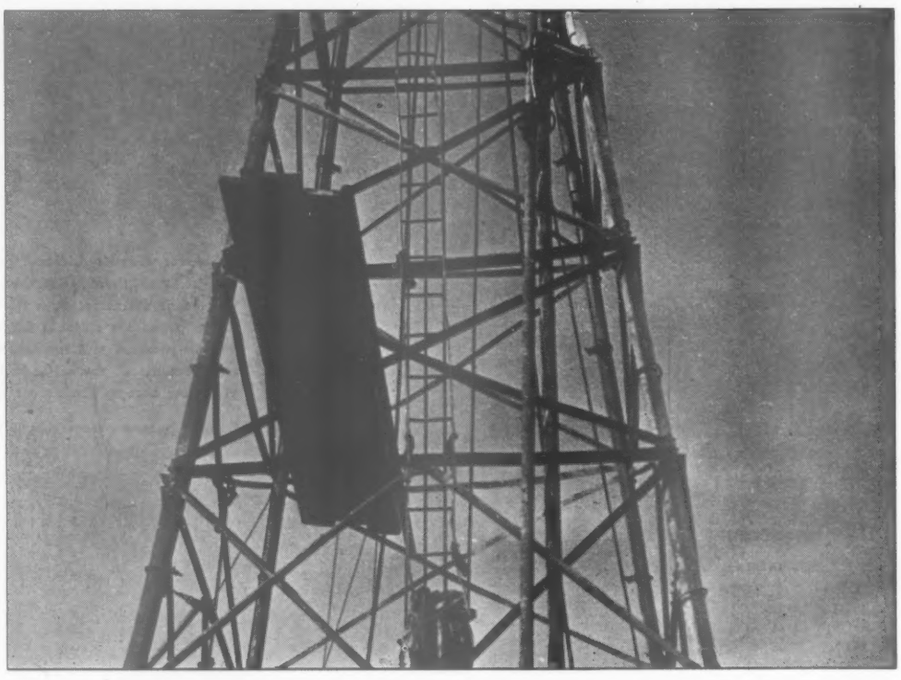
The Portex Oil Co. proposes to charge approximately 5 cents per 2,000 cu. ft. of gas processed and repressured. At this rate, assuming a 2,000 to 1 gas-oil ratio, a saving of 3 cents per barrel would be effected by the plant, considering lifting costs alone. To this figure add the estimated 50 per cent additional recovery which, if lost, and at the assumed price of $1 per barrel, would amount to an added cost of 47.5 cents per barrel (increased revenue from the added production at the 5-cent repressuring charge, reduced to the basis of actual recovery without pressure maintenance).

While it is recognized that these figures are based on the premise that oil production exists at Joaquin, it should be recognized that a plan providing for future possibilities is very important at this time. The organization of a production project for the field now will circumvent many problems which, later in the field's development, will complicate matters. The plan for pressure maintenance loses none of its importance even when applied to distillate production alone, for with the present proven gas and distillate reserves, complete repressuring of all gas is of utmost necessity in recovering valuable condensates. The heavier fractions of the gas, which exist in the vapor phase under the reservoir pressures, will condense in the sand as the field pressure declines through the retrograde condensation range and recovery of a considerable amount of this valuable product would be lost without maintenance of the original pressure.

Two additional points of conservation remain to be mentioned. Under a repressuring plan, the gas itself, instead of being wasted as the field is produced, is returned, and will remain in place for future use after the field has been depleted of any condensate or oil reserves. In view of the increasing value of gas, as indicated by advances in the technology of polymerization, this factor may amount to much more than currently appreciated.

A pressure maintenance plan will further benefit producers in facilitating adequate drainage of the field with a wider well spacing pattern. Drilling expenses thus cut will figure largely in the overall cost of drilling in the field. It has been proven in other areas that the spacing pattern provided under a cooperative pressure maintenance plan, will result in a saving of drilling investment in excess of the cost of the entire repressuring project.

SAFETY — Bent Girt Makes Derrick Dangerous



Derrick design has improved with other machinery in the oil fields; it is now unusual that a derrick, which is being used in a proper manner, fails. The maximum load to which a derrick can be subjected and be within safe operating limits is stamped on the name plate which also carries the specifications. Derricks are designed with the task they are to perform in mind and come in a variety of sizes for a variety of purposes.

Light derricks are erected over producing wells for the pulling of rods and tubing when repairs are being made to the well. By the addition of re-legs, the strength of the columns can be increased enough to make drilling derricks; derrick manufacturers do not ordinarily recommend this procedure.

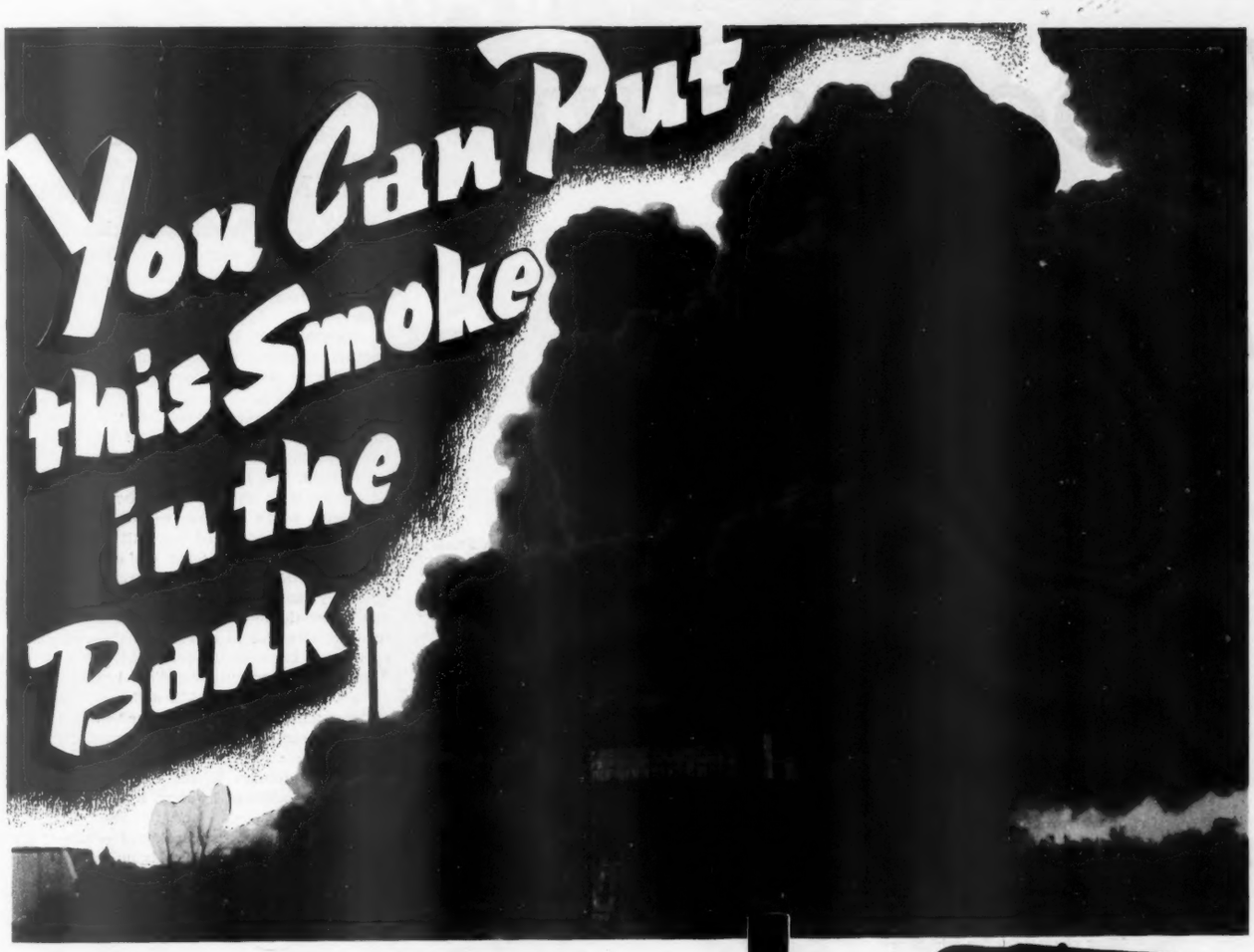
The rated load of the derrick assumes that the legs are straight and properly braced as crooked legs will withstand far less strain because they have been weakened by the previous bending and sometimes a very light load will be sufficient to cause buckling of the structure. Bent girts mean that the derrick legs are also crooked.

Pictured above is an angle type derrick with tubular re-legs; this derrick was originally a pumping derrick but is now being used for drilling in Illinois shallow fields. Re-legging is not the only problem to be met as is evident by the badly bent girt which supports the double board. This is one of the main objections to the practice of using pumping derricks for drilling: the girts and braces are not designed for the loads to which they will be subjected.

This double board is made from 3- by 12-inch oak timber and is not nearly as heavy as boards ordinarily used on drilling derricks; the girt is evidently not heavy enough to support the load of a light board and has bent, pulling the derrick legs out of line. An unusual strain, such as sudden sticking of the drill pipe, will be enough to cause the derrick to collapse.

If it is necessary for any reason to use one of these derricks for drilling purposes, a stronger girt should be purchased for the double board. Some derrickmen insist on installing a false girt in the derrick to support the board independent of the regular girt. If material for a false girt is not available, part of the load may be taken from the girt and placed on the derrick leg by running a strong guy wire from just above the next highest girt to the front of the board.

Bent girts are not only dangerous because of the weakening of the structure but also because it is much more difficult to maintain body balance on a sloping board. Danger of falling from the board is thus increased.



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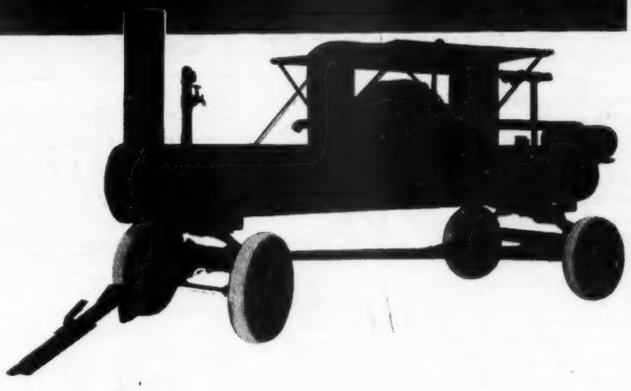
When this Treater is used continuously on the producing property to treat-out emulsions, which conventional heating, settling and washing processes do not adequately handle, it almost entirely eliminates accumulations of "tank bottoms" and waste oil which would eventually be burned or otherwise disposed of. It saves both labor and oil.



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Progress in METALS

By W. L. NELSON

Acetylene Welding of Chromium Steels

Abstract: "The Oxy-acetylene Welding of Corrosion-Resistant Steels," from Oxy-Acetylene Tips, page 197, September, 1938, of the Linde Air Products Co.

Corrosion-resistant steels welded properly by the oxy-acetylene process will contain welds having physical properties and corrosion-resistant properties equal to those of the parent metal. The fact that the corrosion-resistance is not impaired by welding is of great importance because otherwise the main purpose of using stainless steels is defeated.

Although there are three different groups of chromium steels from the standpoint of welding, namely:

1. Straight high-chromium steels that are air hardenable (14 per cent Cr. or less providing the carbon is low).
2. Straight high-chromium steels that are not hardenable (more than 14 per cent Cr.).
3. The austenitic chramium-nickel steels (such as 18-8).

There are certain welding characteristics which are common to all three types of steels.

Flame adjustment.—The chromium steels are not as good conductors as carbon steels and hence the weld stays hot longer with the result that excessive heating tends to occur. For this reason a smaller welding tip (one or two sizes smaller) should be used and the pool of molten metal should be kept as small as possible but tending toward a slight excess of acetylene if a neutral flame cannot be maintained.

Welding rod.—Rods containing 1 to 1½ per cent more chromium than the base metal are recommended in order to allow for slight losses by oxidation. With unknown materials, strips of the base metal may be used. Special stainless steel flux should be used.

Position of blowpipe.—Oxidation is prevented by keeping the tip of the inner cone of the flame in contact with the pool of metal. The angle of the flame should be steeper than usual, being about 80 degrees with the horizontal. The welding rod should be held in the inner cone during heating or feeding-in, and removed from the flame completely at other times.

Joint design.—Butt-type joint—up to one-sixteenth inch sheet (16 gauge) forehand method. Vee-type joint—one-sixteenth inch to one-quarter inch. Double Vee—one-quarter inch up—backhand method.

Finish treatment.—The building-up of the thin oxide film which causes the resistance of the chromium steels can be hastened by immersion in 20 per cent nitric acid for 30 minutes, followed immediately by washing in cold water.

Group 1—Air-Hardening Straight Chromium Steels

This group of steels usually contains less than 14 per cent of chromium and less than 0.12 per cent of carbon. Unless colors are to be matched or special services are encountered, chromium nickel steel rods containing some columbium and higher percentages of chromium than the base metal are recommended. Thus, the columbium bearing 18-8 to 25-12 chromium-nickel steels are recommended.

Due to the tendency of these steels to harden excessively and possibly crack during welding, the weld must be preheated locally to a temperature of 300°-400° F. and annealed immediately after welding without allowing the weld to cool by heating to 1,300° F. for three minutes with the torch or in an annealing furnace.

Group 2—Non-Air-Hardening High Chromium Steels

Such steels contain more than 14 per cent chromium and such an amount of carbon that the chromium content minus 17 times the carbon content, is greater than 12.5. Such steels are also made non-hardening

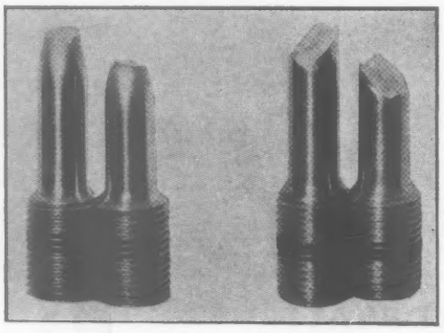

Fig. 1—Effect of columbium in reducing air-hardening tendencies is shown in tensile-test specimens of 6 per cent chromium steel. (Left) With 0.70 per cent columbium—shows elongation before rupture. (Right) No columbium—brittle fracture

by adding columbium to the extent of six times the amount of carbon. The columbium bearing steels need not be heat treated if welded with a 25-12 chromium nickel rod.

The stock, unless very thin, should be preheated to 200°-400° F. but annealing after welding is not necessary if the steel contains more than 24 per cent of chromium. The effect of annealing on the physical properties of a 17 per cent chromium steel is indicated in Table 1.

TABLE 1—PHYSICAL PROPERTIES OF WELDS IN 18-GAUGE NON-AIR-HARDENING CHROMIUM STEELS*

	Unwelded	As-welded	Blowpipe-annealed†	Furnace-annealed†
Yield point, lb. per sq. in.	64,700	41,500	45,100	64,200
Ultimate strength, lb. per sq. in.	77,800	53,400	65,300	73,250
Elongation, per cent	31.0	1.0	4.0	10.5

*Typical analysis: Chromium 17.21, carbon 0.08 per cent, manganese 0.29 per cent, silicon 1.05 per cent.
†Anneal at 1,202° to 1,382° F. (650° to 750° C.) for 3 minutes followed by air-cooling.

Group 3—Austenitic Chromium Nickel Steels

The most popular steel of this type is the 18-8 variety although several steels of higher alloy content are encountered. The corrosion resistant properties of such steels are obtained by quenching from 2,000°-2,100° F. in water and hence if the corrosion resistance of the weld is to be satisfactory, it too, must be finished by heating to this temperature and quenching. For parts that cannot be heated and quenched, the columbium bearing varieties must be used. The main difficulty in welding technic is caused by the large coefficient of expansion.

The beneficial effect of columbium in alleviating brittleness is indicated in Figure 1.

Metallurgical Terms

Types of Pearlite

The following definitions are taken directly from the 1936 edition of the Handbook of the American Society for Metals. Similar definitions are given in A.P.I. Code No. 28.

Pearlite—The lamellar aggregate of ferrite and carbide resulting from the direct transformation of austenite at Ar, (or the lower critical temperature, about 1,350° F.).

Note: It is recommended that this word be reserved for microstructures consisting of thin plates or lamellae—that is, those that may have a pearly luster in white light. The lamellae can be very thin and resolvable only with the best microscopic equipment and technique, which fact has caused many fine pearlites to be erroneously called "troostite" or "sorbite."

Granular Pearlite (also globular pearlite and divorced pearlite)—A structure formed from the pearlite phase by long annealing of steel or at a temperature just below the lower critical point causing the cementite to spheroidize in a ferrite matrix. Since "pearlite" connotes a lamellar structure, this name is not recommended; the word "spheroidite" has been proposed.

Spheroidal or Spheroidized Cementite—The product of long annealing of unhardened steel (spheroidizing anneal) near but below its transformation range, whereby the carbide lamellae in pearlite areas ball up into small globules in the ferrite matrix. The same structure is achieved by long, high tempering of hardened steel.

Note: The term "spheroidized pearlite" should be avoided, when the structure is undoubtedly the result of spheroidizing anneal of a pearlite steel. The term "spheroidite" has been proposed.

Welding of Molybdenum Steel

Abstract of paper by R. W. Clark, entitled "Welded Joints in Carbon Molybdenum Piping" presented at the annual meeting of the American Welding Society, October 16-21, 1938.

The somewhat recent increase in steam plant temperatures and pressures in modern power stations, (and the extreme conditions already encountered in the petroleum refining industry) has placed much more rigid requirements on joints in piping for this service.

The use of carbon-molybdenum steel is accepted as one of the best base stocks for pipe—and welding as the most satisfactory method of joining it, but controversy has arisen over some of the details of electric welding procedure. In an effort to settle these questions, two sets of experiments were conducted. The first of these was aimed at the study of groove design, welding procedure, and methods of heat treatment and inspection. The second series of experiments was made to determine the residual strains (or stresses) in welded pipe joints under various conditions of welding and heat treatment.

It was found that sound joints were made with any of the four groove designs that were investigated. When using the procedure and grooves recommended by the author, it was not necessary to chip each bead or the craters. A recording volt meter was used during the welding operations, and irregularities in the arc voltage records did not correspond with defects.

Residual stresses were studied by cutting 15-inch lengths of pipe, having a circumferential weld at the center, into longitudal test specimens which were one-half inch wide. These specimens were found to be bowed slightly and the degree of residual stress was ascertained by the magnitude of the deflection of these specimens. The welds made at 100° F. showed the greatest residual stress when examined in the as-welded condition but even the welds made at 500° F. showed some residual stress. When examined in the stress-relieved condition, all specimens were much alike regardless of welding temperature and were scarcely more stressed than the original pipe before welding.

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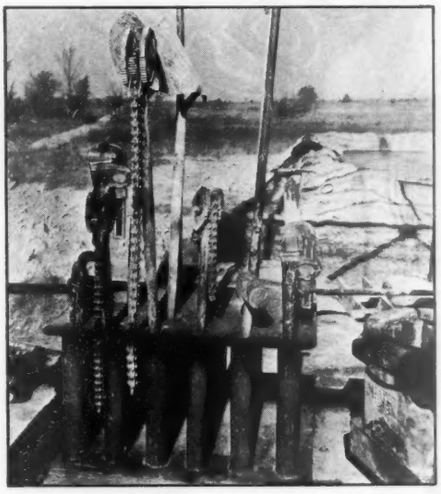
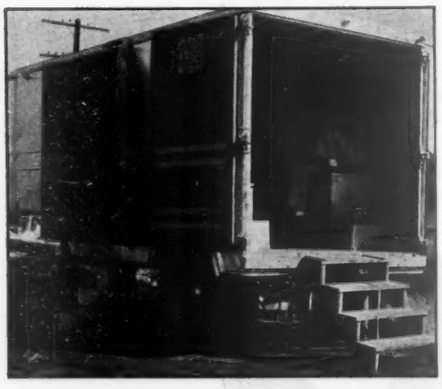


Tool Rack on Rotary Rig

An oil company, operating its own tools in the development of properties in the Illinois fields, uses a tool rack which is carried with the rig. This is constructed of short nipples of tubing welded to a piece of sheet iron at the bottom to furnish a base; a perforated plate welded to the top insures rigidity. Provision is made for holding the necessary tools used around a drilling well. This rack is convenient enough to encourage the crew to keep tools where they can be easily picked up when wanted.

Beer Trailer Becomes Drillers' Doghouse



A drilling contractor in the Centralia, Ill., field has converted a beer truck-type trailer into a doghouse and toolhouse. In the front end of the body, shelves have been made for fittings and bolts. Being well insulated it is cool in summer and warm in winter.

Deadman for Pulling Unit at Pumping Well

Anchoring of the pulling unit frequently takes a major portion of the time required on a rod and tubing job on a well but this Kansas operator saves time by having a permanent deadman designed to fit his machine. A pipe with lines around it was buried in concrete in the usual manner and a piece of 4-inch drill pipe as long as the width of the pulling unit was placed through the loops above the ground. For anchoring the unit, chains are passed around each end of the skid cross member and the anchor pipe; boomers are used to tighten the chains equally when pulling equipment is installed for servicing the well.

Reducing Rod Line Whip

Reversals of stress in rod lines, when combined with change of angle at such points as hold downs or travelers for road crossings, set up a whipping action which when intensified by a rod line clamp or other localization of weight, quickly results in line failure. A device for suppressing this whip is located on a lease in East Texas where the line moves vertically through some 4 inches for each stroke cycle. Midway in the span between the two rolling supports of the line a post is set, carrying a notched block supported by lever and toggle. As the line rises or falls, the lever, through its counterweight, holds the bearing against the rod, effectively controlling any vibration which might tend to occur there. Weight on the end of the lever is just sufficient to impose a slight upward bow in the line and thus maintain sufficient pressure to assure a steady pull since the rod line is thus kept taut throughout the stroke cycle while wells are pumped.

Cart for Pump

In some parts of Illinois basin, considerable oil is transported by trucks. One company loads its trucks with a small portable rotary pump driven by a one-cylinder air-cooled gasoline engine. This pump is mounted on a two-wheeled cart which can be moved around on the lease by one man. This will load about 1,000 gallons per hour.

Good news is contagious

NOW we add to the list we published last December eight more refiners who make Dubbs-cracked gasoline

James B. Berry Sons Company	*Oil City, Pennsylvania*
Continental Refining Company	*Oil City, Pennsylvania*
*Cooperative Refinery Association	*North Kansas City, Missouri*
Derby Oil Company	*Wichita, Kansas*
*Mid-West Refineries, Inc	*Alma, Michigan*
Root Petroleum Company	*El Dorado, Arkansas*
Shell Oil Company of Canada, Ltd	*Montreal, Quebec*
Wolverine-Empire Refining Company	*Reno, Pennsylvania*

Ask them about their Dubbs-cracked gasoline

* Building

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Atlantic Refinery on

By NEIL WILLIAMS

The Atlantic Refining Co.'s combination cracking and polymerization plant at Atreco, near Port Arthur, Tex., one of the latest additions to Gulf Coast refineries, embodies a number of special features in design and processing with a view toward unusually effective and efficient operation. Designed to process slightly more than 19,000 bbls. (50's) of East Texas crude oil daily, the plant is recovering the following products simultaneously:

1. Depropanized straightrun gasoline.
2. Gray-treated, stabilized, cracked and polymer gasoline.
3. Furnace oil medium.
4. Vis-breaker and cracked fuel oil, which, when blended as produced, give a fuel oil of Bunker C specifications.

When export naphthas are not being made, total production of straightrun and cracked naphthas, blended in ratio to their respective yields, gives a specification gasoline having high octane value. Wide variation in types of gasoline produced is permitted.

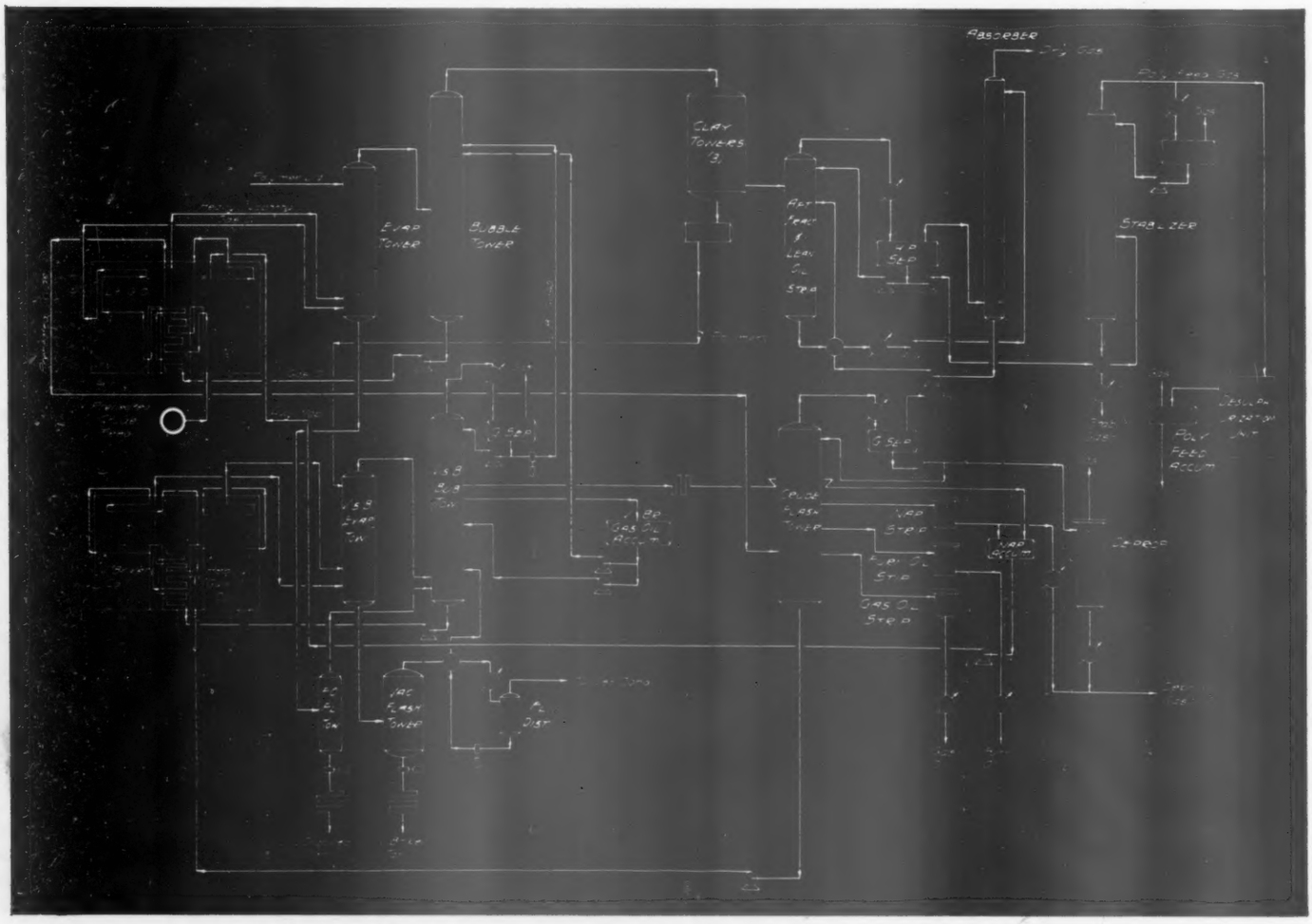
The plant, built by M. W. Kellogg Co., and licensed by Gasoline Products Co. and the Polymerization Process Corp., embraces five general phases of operations, namely: crude distillation, viscosity breaking and heavy gas oil cracking, light gas oil cracking, reforming and polymerization. The first four comprise the functions of the combination cracking unit. By vis-breaking the reduced crude once and cracking the heavy gas oil in a recycle operation, an increased yield of light gas oil stock is obtained for cracking in the high-temperature cracking zone, thus giving an increased recovery of high-octane gasoline. Propanes produced in the cracking phases, as well as all the butanes that cannot be held in the Gray-treated gasoline, are charged to the polymerization plant. The combination unit is operative either with or without the poly plant.

Cracking Equipment

Essential units included in the cracking equipment are:

1. Crude oil distillation equipment.
2. Single pass viscosity breaker unit.
3. Vacuum flashing equipment, operating at 75 mm. absolute pressure, for reducing vis-breaker tar.
4. Two separate cracking systems, one for heavy gas oils and the other for light gas oils.
5. Naphtha reforming unit.
6. Three clay towers for Gray-treating.
7. Stabilizer for cracked gasoline, and a depropanizer for stabilizing straightrun gasoline.
8. Absorber tower, designed to recover all butanes (C_4's) and 95 per cent of the propanes (C_3's) in the gas from the cracking process for polymerization operations.
9. After-fractionator, a dual purpose tower serving to remove polymers from the Gray-treated distillate, and to strip the rich oil from the absorber.

Economical production of 70-octane gasoline in the cracking unit is contingent upon certain operating factors which are consistently observed. In the initial crude distillation, the light straightrun gasoline is maintained at a maximum endpoint of 300° F., leaving the heavy straightrun naphtha sidestream to be reformed. In viscosity breaking and heavy gas oil cracking, the combined naphthas from these comparatively mild cracking operations are low in octane level, so 60 per cent is taken over-



Simplified flow diagram of combination unit in Atlantic Refining Co. plant at Atreco, Tex.

Gulf Coast

head at 300° F. endpoint, and the remainder is reformed. The gas oil fresh feed to the light gas oil cracking phase is maintained at a maximum endpoint of 650° F. to permit high temperature cracking.

On this basis of operation, with the plant on East Texas crude oil and running to its designed capacity of 19,068 bbls. (50's) recoveries are:

Products—	With poly. plant (bbls., 50's)	(%)	Without poly. plant (bbls., 50's)	(%)
Straightrun gaso.	3,528	18.5	3,528	18.5
Cracked gasoline	7,496	39.3	7,496	39.3
Poly. gasoline	985	5.2	.....	...
Total gasoline	12,009	63.0	11,024	57.8
Furnace oil med.	2,285	12.0	.....	...
Vis-breaker fuel oil	1,401	7.4	.....	...
Cracked fuel oil	2,403	12.6	.....	...
Total fuel oil	3,804	20.0	.....	...
Gas and loss	.....	5.0	.....	10.2

Two furnaces, one containing the crude oil, light gas oil cracking and naphtha reforming coils, and the other the viscosity breaking and heavy gas oil cracking coils, cover the requirements of the combination unit. They are in effect two double furnaces, each having two separate radiant heating sections, one for each of the above phases of operations except crude oil distillation and naphtha reforming, coils of which occupy the same radiant section of the first furnace.

Combination Burners

Both furnaces, of the forced draft type, are equipped with combination gas and oil burners, and utilize air preheated by hot flue gases in vertical tubular preheaters. Nearly 100 per cent gas is being used for fuel but should operations at any time not supply sufficient residue gas, oil can be fired readily. The crude oil, light gas oil cracking and reforming furnace is 84 feet and 7⅞ inches long, 21 feet and 1 inch wide, and 44 feet high, outside overall dimensions. It has a normal heat liberation of 198,500,000 B.t.u. per hour for a furnace duty of 156,760,000 B.t.u. per hour (78.93 per cent). The viscosity breaking and heavy gas oil cracking furnace is 69 feet and 10⅝ inches long, 19 feet and 3 inches wide, and 34 feet high, outside overall dimensions. This furnace has a normal heat liberation of 104,400,000 B.t.u. per hour for the 82,480,000 B.t.u. per hour furnace duty.

In the first, or crude distillation, phase of the combination unit, the crude feed, preheated in a succession of heat exchanges, is charged to the crude furnace coil at 545° F. The furnace is fired to raise the temperature of the charge to 650° F., which temperature is necessary to reduce the crude to the desired yield of bottoms in the crude flash tower.

As the heat load at the top of the crude flash tower is the largest single load in the entire combination unit, and exists at the lowest temperature differential, furnace oil recirculation is practiced. This shifts the load to a point of considerably high M.T.D., which effects a material reduction in the cooling surface required. For this recirculation, a portion of the furnace oil sidestream is cooled through the depropanizer reboiler duty (see flow sheet), and recycled to the tower. The recirculation is maintained at a maximum rate consistent with good fractionation rather than at a rate desirable for depropanizer reboiler duty.

The light overhead naphtha from the crude flashing operation provides feed for the depropanizer, from which the straightrun depropanized gasoline is taken from the system. The heavy naphtha sidestream, together with a heavy naphtha cut in the later vis-breaking and heavy gas oil cracking operation, provides the feed for the reformer system. When export gasolines are being made, a portion of this stream is taken from the system as needed for blending with the depropanized straightrun gasoline to meet various export specifications.

Furnace oil medium is taken direct from the system as needed to supply sales requirements. Any in excess of such needs goes with the gas oil stream as feed for the light gas oil cracking system. When the heavy naphtha stream is being drawn upon to make export gasolines, the furnace oil is used as make-up feed for the reformer system. The remaining reduced crude bottoms, constituting 42 per cent of the original crude charge, is charged to the vis-breaker system.

General view of polymerization unit at Atlantic Refining Co. new plant at Atreco, Tex.

Results of the crude flashing operation are given in the following tabulation of crude charge and product yields:

Material—	Per cent	Bbls./day (50's)	Remarks
Crude charge	100	19,068	22,700 bbls. (42's)
Product yield:			
Straightrun light naphtha	18.5	3,528	300° E.P.
Reformer naphtha	16.5	3,146	.....
Furnace oil medium.	*12.0	2,288	.....
Gas oil	10.0	1,907	.....
Reduced crude	42.0	8,009	.....

*Furnace oil stream varies according to specifications set up for this cut. All furnace oil in excess of 12 per cent for sales requirements is pumped to light gas oil system with crude flashing gas oil stream.

The vis-breaker heating coil raises the temperature of the reduced crude from 600° F. at the inlet side to 870° F. at the outlet at which temperature the charge is transferred to the vis-breaker evaporator and bubble tower system, along with that from the heavy gas oil cracking coil. The latter system operates in conjunction with the vis-breaking, recycling the heavy gas oil bottoms from the vis-breaker bubble tower. Additional feed for the vis-breaker bubble tower includes a gas oil recycle stream from the high-pressure bubble tower (see light gas oil cracking system flow chart), and recycle bottoms from the Gray treating towers.

In the top of the evaporator a temperature of 800° F. is maintained. Reflux for the top is taken from the bottom of the vis-breaker bubble tower. Vapors allowed to pass overhead are passed to the bubble tower for fractionation. The vis-breaker tar which accumulates in the bottom (temperature 820° F.) is directed to the vacuum flash tower for further processing.

Vacuum flashing, operating at 75 mm. absolute pressure, involves stripping the essentially virgin heavy gas oil from the vis-breaker tar.

The maximum viscosity to which the vis-breaker tar may be vacuum flashed is governed by various factors, namely, cost of producing the vacuum, ability to handle the reduced tar without coking the apparatus or plugging the lines, and color of the vacuum flash distillate. Pressures under 75 mm. absolute are not considered economical for this application of vacuum flashing.

Flash Distillate

The flash distillate, consisting of heavy gas oil ends with a gravity of 18° A.P.I., stripped from the tar, passes overhead to find its way to the heavy gas oil cracking system as recycle. The vacuum flash tar bottoms, having a gravity of 5.3° A.P.I. are pumped from the system as vis-breaker fuel oil.

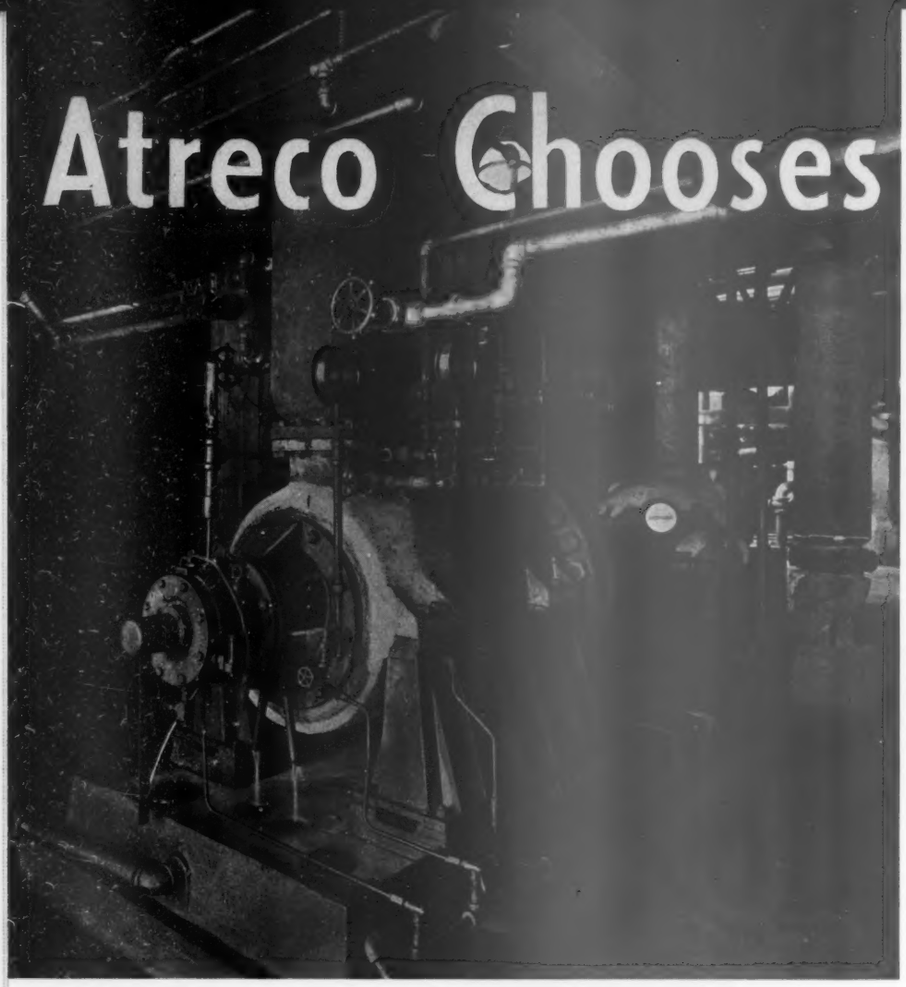
Blending of the latter fuel oil with the cracked fuel oil (flash tar) stream from the high-pressure flash tower gives a fuel oil that meets Bunker C specifications. In the flashed high-pressure tar is refractory recycle stock from the high-temperature cracking system that replaces the heavy gas oil stripped from the vis-breaker tar; also, the viscosity of the flashed high-pressure tar is made low enough that the final blend meets the Bunker C specifications. The cracked fuel oil is 10° A.P.I.

The light naphtha ends taken overhead from the vis-breaker bubble tower find their way to the light gas oil system either in the form of wet gas or as liquid, the stream being divided in a gas separator to provide a source of reflux material. Two side-streams are cut, one a heavy naphtha, which with the heavy naphtha from crude flashing provides feed for the reforming system, and the other gas oil, which is charged with the crude flash gas oil as feed to the light gas oil cracking system.

Vis-breaker bubble tower bottoms, consisting of heavy gas oil, are recycled as charging stock to the heavy gas oil cracking coil.

(Continued on Page 75)

Atreco Chooses BYRON



IN A PLANT as modern and efficient as the **ATRECO REFINERY** you would naturally expect to find **BYRON JACKSON PUMPS.** Pictured here are several of the 33 Byron Jackson Pumps at Atreco—every pump "engineered" to perform a specific service, meeting every specification.

This Byron Jackson Double Case Hot Oil Pump (left) is in Recycle Charging Service, pumping 493 g.p.m. of 700 degree F. oil against 1,000 pound discharge pressure (3250-foot pumping head).

BYRON JACKSON DOUBLE CASE HOT OIL CHARGING PUMPS

THERE ARE 8 OF THESE PUMPS IN SERVICE AT ATRECO

These pumps have gained the favor of operators because they can be so easily dismantled and reassembled in the field, without disturbing piping or drivers, and with no necessity for field work upon the Rotating Element. See illustrations below.

Engineers approve them because of the simple design which provides also perfect hydraulic balance without using any so-called balancing devices that inevitably wear and cease to function, thus throwing heavy loads upon the thrust bearings.

DISMANTLING IS EASY

With simple minor bearing parts removed, and End Cover with Bearing Housing being removed. Neither the Piping nor the Driver has been disconnected or disturbed. The Dismantling Tray in foreground will be found in position in views at right.

The Dismantling Tray is bolted in position supporting the Inner Volute Case and Rotating Assembly here being removed as a single unit. In spite of the large amount of coke present, the Inner Volute Case is easily removed due to the irregular sections which permit breaking away the coke. The Byron Jackson design eliminates close clearance points which cause binding.

Byron Jackson Double Case Hot Oil Charging Pumps have the inner case split horizontally along the shaft centerline. Both halves of the case are easily withdrawn from the Outer Barrel because of the irregular section with no close fits to become solidly "coked up" in service.

. . . . bring on that spare assembly! The Rotating Assembly is easily removed as an assembled unit. Any necessary repairs to wearing parts are made in the machine shop, and not in the field where conditions for work of this nature never can be the best. . . . The spare Rotating Element is simply dropped into position and the pump re-assembled, with down time and repair expense reduced to a minimum.

Established 1872

BYRON JACKSON

CENTRIFUGAL PUMPS FOR EVERY SERVICE

In the heavy gas oil cracking coil, temperature of the charge is increased from approximately 700° F. at the inlet side to 950° F. at the outlet. This heated oil is passed with a part of a side-stream of heavy gas oil from the high-pressure bubble tower of the high-temperature system, and the heated reduced crude from the vis-breaker coil, to the vis-breaker evaporator, as previously explained.

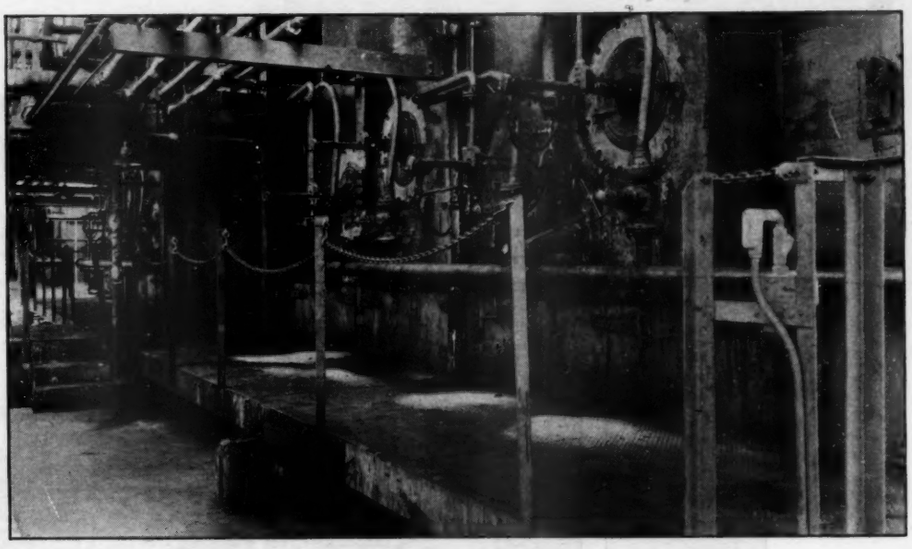
Light Gas Oil Cracking and Reforming

Light gas oil cracking and reforming, utilizing the same evaporator and bubble tower, comprise a joint high-pressure cracking system. Charging stock for the light gas oil cracking phase consists of the light gas oil pumped from the bottom of the system's bubble tower. This includes the gas oil from the crude flashing tower and the vis-breaker gas oil, which enter the tower direct from their respective systems, and the gas oil from reforming. Charging stock for the reforming phase consists of the heavy naphtha from the crude flash tower and the vis-breaker bubble tower.

The gas oil cracking charge is raised in temperature from 610° F. at the inlet side of the coil to 1,000° F. at the outlet. Before the charge enters the evaporator the temperature is reduced to 850° F. by the injection into the transfer line of a stream of recycle gas oil. The latter stream, taken from the side of the bubble tower at a temperature of 700° F. is cooled in stabilization tower reboiler duty and returned to the system at a temperature of around 400° F. A part of the stream also is returned to the evaporator by way of the reformer coil transfer line (to be referred to later).

The reformer naphtha is pumped to the reformer coil at a temperature of 340° F., which is raised to 1,000° F. in the reformer coil. As in the case of the gas oil stream, the temperature of the reformer naphtha is reduced to 850° F. before the charge enters the evaporator. This is done by the same means, a part of the cooled recycle gas oil stream being injected into the reformer transfer line.

The evaporator is refluxed to the end that the overhead material is of good color and the temperature at the bottom does not cause coking. Into the evaporator also is pumped the polymer gasoline from the polymerization plant, which contains about 10 per cent gas oil and a small quantity of butane.



Firing ends on a long line of heaters

The tar held in the evaporator in the light gas oil cracking phase is passed to the high pressure fuel oil flash tower. As previously explained, sufficient refractory recycle is held in this tar to replace the heavy gas oil stripped from the vis-breaker tar in the vacuum flash operations. The flashed high pressure tar taken off the bottom of the high pressure fuel oil flash tower is blended with the 5.3° A.P.I. flashed vis-breaker tar (vis-breaker fuel oil) stream to make a fuel of Bunker C specifications.

Provision is made to reflux the high pressure fuel oil flash tower with recycle from the high pressure bubble tower or vis-breaker gas oil, although the latter is not used except in an emergency because it essentially is virgin gas oil.

Evaporator overhead material, consisting of the gas oil and gasoline stripped from the tar and including the polymer gasoline entering the system, is passed to the high pressure bubble tower where the gas oil is retained to be recycled with the fresh feed of crude flash and vis-breaker gas oil to the gas oil cracking coil. The cracked and polymer gasoline goes overhead to the Gray towers for treating, and thence to the after-fractionator, where polymers are removed from the Gray-treated distillate, and returned to the cracking system. Stabilization of the gasoline and recovery of propanes and butanes for polymerization plant feed complete the cycle of the combination plant.

Export Market

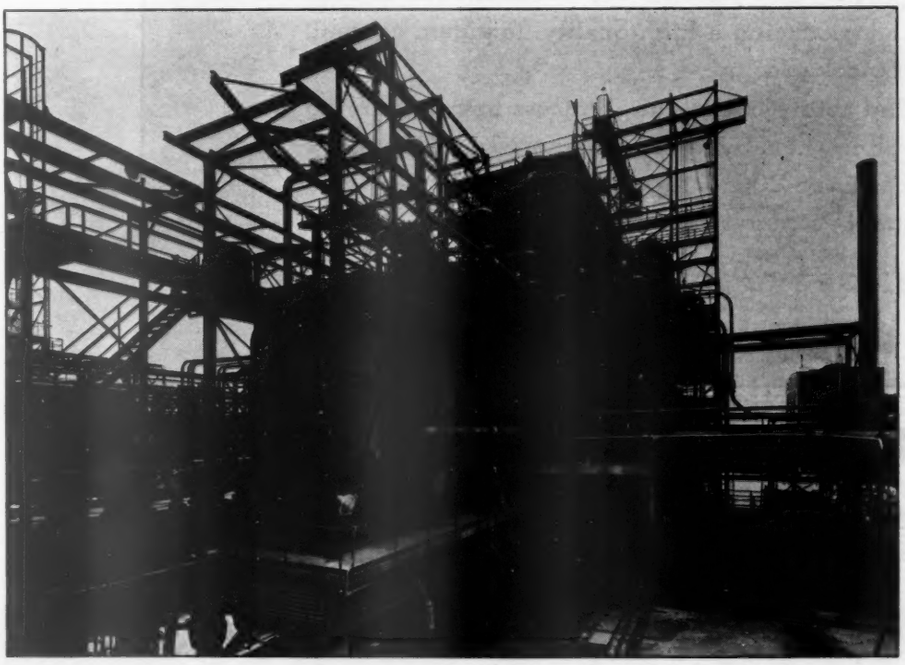
Processing described covers operation of the combination unit for the production of domestic gasolines. When export gasolines are being made, a decided change is made in reformer coil operations. The reformer coil is designed for a charge of 4,200 bbls. (50's) per day, and in view of the time temperature relationships, it cannot be operated practically on a materially lower throughput. Diversion of a portion of the heavy (reformer) naphtha sidestream from the crude flash tower direct to the depropanizer outlet for blending of export gasolines, although it does not affect the operation of the crude flash tower, reduces the supply of naphtha for reformer coil charge, and necessitates that the naphtha withdrawn from the system must be replaced by other material.

For replacement material, a portion of the cooled furnace oil stream can be discharged into the reformer naphtha accumulator drum for charging to the reformer coil. This material has a materially higher endpoint than the reformer naphtha that it replaces, which necessitates that the temperature of the reformer transfer line to the evaporator be reduced slightly.

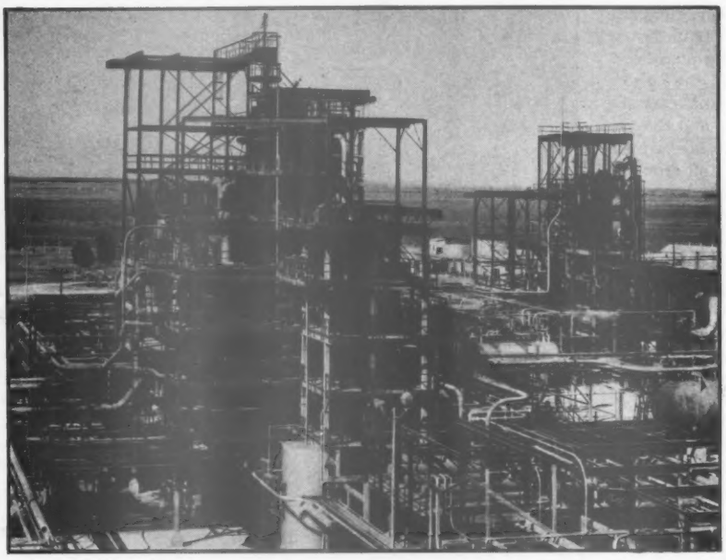
Stabilization of gasolines and recovery of poly plant feed material embodies a number of unusual operations. Both gas and liquid feed from the combination unit, which includes the recycle polymer liquid, together with recycle gas from the poly plant feed accumulator, are handled. This places more than the customary duties and loads upon the stabilization plant installation. Main units of this installation include an absorber tower and stabilizer tower, together with the after-fractionator, which operates in conjunction with the other units.

When the polymerization plant is not in operation, the absorber's only function is to scrub all the pentanes and enough butanes from the cracking unit gas to permit the stabilized gasoline to meet specified vapor pressure. However, when the polymerization plant is running, the absorber serves to extract up to 95 per cent of the propanes

(Continued on Page 78)



Combination cracking unit showing three Gray towers at left. In the right background is a portion of the steam plant



GRAY

THREE GRAY TOWERS TREAT CRACKED AND POLYMER GASOLINE AT ATRECO

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The ability of the Gray Process to treat varying gasolines equally well—whether the plant has a capacity of 200 or 30,000 barrels per day—is a distinct economic advantage.

THE GRAY PROCESSES CORPORATION

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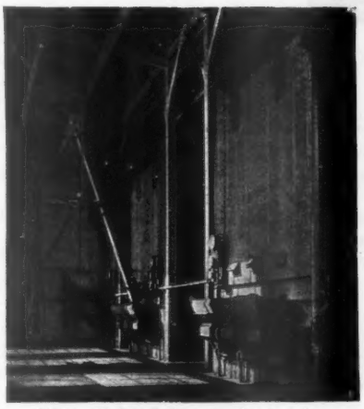
CLAY TREATING

MODERN PROCESS EQUIPMENT

by

Vogt



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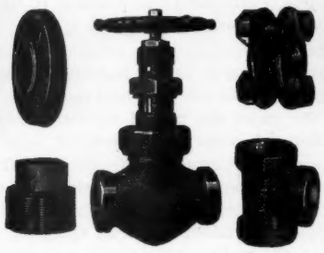

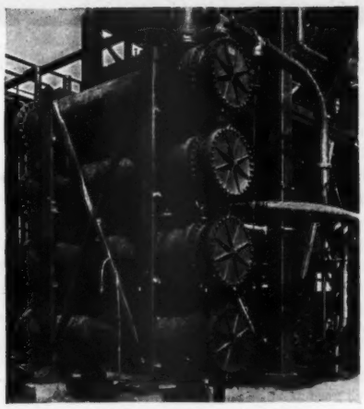

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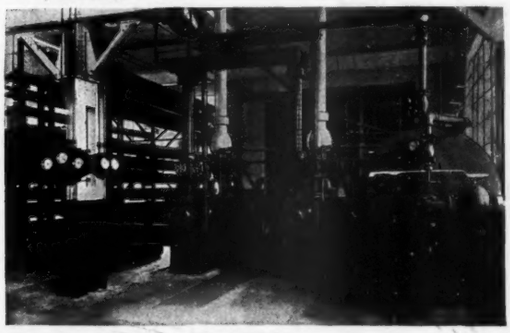

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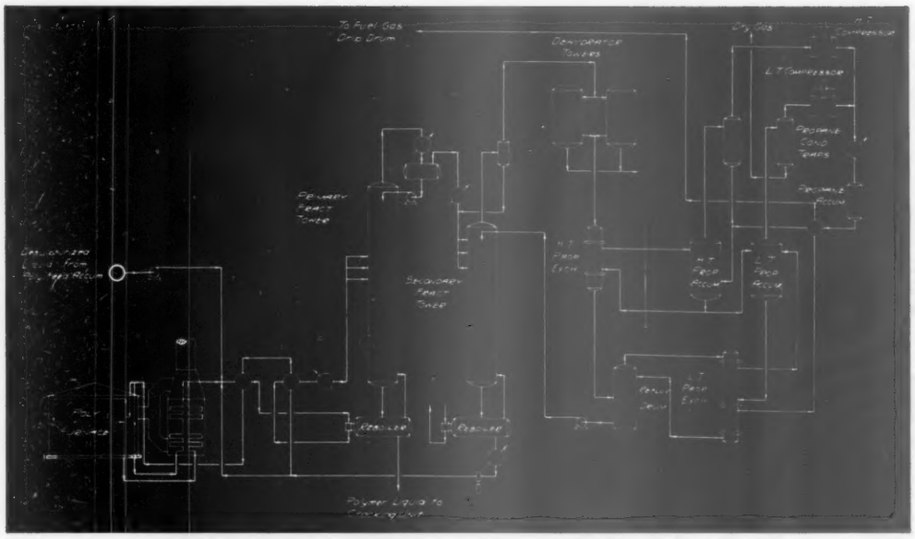
EQUIPMENT FOR THE REFINERY, CHEMICAL, AND POWER PLANT

Vogt Refinery Equipment is in service in the New Modern Atlantic Refinery at Atreco, Texas



Flow diagram of Atreco thermal polymerization unit

and all the heavier constituents of the rich cracked gases. The propanes, together with all the butanes that are not held in the stabilized gasolines, find their way into the stabilizer overhead gases and into poly feed material.

In the process the propanes and heavier constituents extracted in the absorber are passed to the after-fractionator, where the rich oil, along with the Gray-treated distillate from the Gray towers is stripped. Overhead, consisting of propanes, butanes and desired heavier constituents, cooled in heat exchange with incoming cold crude charge, is taken to the high-pressure gas separator. The lean oil bottoms (43° A.P.I. gravity) are returned to the cracking system. Uncondensed gases from the high-pressure separator and gas recycle from the poly plant feed drum comprise the feed for the absorber tower. Condensate from the separator provides the feed for the stabilizer tower. Dry gas overhead from the absorber is burned as fuel.

All propanes and the butanes not desired to be retained in the stabilized gasoline are taken overhead to the H_2S absorber for poly feed.

Polymerization Plant

The absorber, in effect, is the first step in the polymerization process. Based on the conditions for which it was designed, the desired propane recovery is obtained with a lean oil at a temperature of 95° F. The polymerization plant processes substantially all propanes produced in the cracking operation, and, in addition, all butanes that cannot be held in the stabilized, Gray-treated gasoline.

A material balance follows:

MATERIAL BALANCE

Material—	Lbs. per hr.	Mols. per hr.	Bbls. per day (50's)	Weight (per cent)	Volume (per cent)
Liquid feed	21,873	501	2,470	100	100
Products:					
Polymer gasoline	10,870	...	892	49.6	36.2
Gas oil	1,459	...	90	6.8	3.6
Total crude polymer	12,329	...	982	56.4	39.8
Tail gas for fuel	9,564	420	*3,820	43.6	...

*Thousands of cubic feet per day.

In this summary the tail gas is composed essentially of methane, ethane, and a small quantity of the C_3's (propanes) that cannot be economically recycled to ultimate yield. The polymer product contains a small quantity of butanes and about 10 per cent gas oil. This is refluxed to the high-pressure evaporator of the light gas-oil cracking system for fractionation.

Principal units of the polymerization plant, in addition to the absorber tower, stripper and stabilizer on the combination unit are:

1. H_2S absorber system to remove 95 per cent of the H_2S from the poly plant feed material.
2. Polymerization furnace.
3. Distillation equipment to prepare a methane-free, pentane-free charge for the polymerization furnace, and to remove the crude polymer gasoline from the system as produced.
4. Gas-fractionating system, operating in conjunction with propane refrigerating equipment, to insure practically complete propane (C_3's) recovery from poly plant residue gas.

Stabilizer overhead gases enter the polymerization system by way of the H_2S absorption tower for purification of the poly feed material. In this tower the gases are passed countercurrent to a circulation of absorption chemical (the Girbitol process) for removal of the H_2S. The absorbent is regenerated continuously in circulation through the reactivator tower, where the H_2S gas is stripped and taken overhead to be burned as fuel with the residue gas from the absorber. The exit gas is practically pure H_2S. Operating pressure of the stabilizer and the H_2S absorber system is set high enough to permit condensation of the poly feed (chiefly propane and butane) at the plant's cooling water temperatures with a reasonable condensing surface. A single valve, located on the exit gas line of the poly feed accumulator drum, controls the pressure on both the H_2S absorber and the stabilizer.

Uncondensed gases taken into the poly feed accumulator drum through a cooler are passed overhead to be recycled to the absorber of the stabilization system. Liquid accumulation in the drum constitutes feed for the polymerization plant.

Due to the fact this condensed feed usually contains more C_1 and C_2 hydrocarbons than desirable for good poly furnace operation, and sometimes may have a small pentane content because of possible irregular stabilizer operation, it is worked up along with poly recycle stock in the primary and secondary fractionating towers to restrict it to the proper constituents before being charged to the poly furnace. The C_1 and C_2 hydrocarbons would dilute the furnace charge and tend to reduce the amount of polymerization per pass.

In the primary fractionating tower operation a reboiler temperature and a top-of-tower reflux ratio is maintained that gives an overhead practically free of pentanes (not over 1½ mol per cent), and bottoms (polymer gasoline) of minimum butane content.

The furnace transfer line provides the heating medium for the reboiler. Bottoms from the tower, retaining all the C_5 (pentane) hydrocarbons, are drawn off as polymer liquid to be refluxed to the high-pressure evaporator whereby the polymer gasoline passes through the remainder of the high-pressure fractionating and clay treating system. It is desirable that all the C_4 (butane) hydrocarbons possible be taken overhead in the primary tower of the polymerization unit because the cracking unit already supplies the stabilizer with more butanes than needed to bring the entire gasoline production of the whole plant to specified vapor pressure, and butanes fed to the high-pressure bubble tower with the polymer liquid create wasteful recycling.

The secondary fractionating tower and its auxiliary fractionating system, into which the overhead (carrying all the C_4 and lighter constituents) finds its way, strips the poly feed of all the nonpolymerizable hydrocarbons (C_1 and C_2's—methane, ethylene and ethane) possible, retaining C_3 and C_4 hydrocarbons for the poly furnace charge. Operation of the system is such that the loss of propane with the tail gas is less than 5 per cent, and at the same time less than 1½ mol per cent of methane is retained in the poly feed.

Auxiliary Equipment

Principal auxiliary units which make up the secondary fractionating system are:

1. Partial condensers for the high-temperature and low-temperature phases, of the propane recovery system. Cooling in each is accomplished by the "flooded" system of refrigeration, utilizing boiling propane as the refrigerant.

2. Secondary tower reflux drum, a fractionating tower in which the light ends are stripped from the propane condensate leaving the low-temperature system condenser. Heat for the fractionating in this tower is supplied solely by the difference in temperature between the vapor-liquid stream from the high-temperature condenser and the condensate from low-temperature condenser.

3. Two dehydrator towers containing alumina as the drying agent. A small quantity of water is brought into the system continuously due to contact of the fresh poly feed with the aqueous solution in the H_2S absorber. This, carried overhead with the tail gas stream from the secondary fractionation tower, is absorbed by the alumina in the dehydrators to prevent freezing in the propane extraction system. The towers remain on the drying phase of the cycle alternatively up to 12 hours at a time to permit regeneration of the alumina in one while the other is in operation.

In effect, the secondary tower system consists of two stages of fractionation (high-temperature stage and low-temperature stage) to permit drying of the tail gas stream in the dehydrators before freezing temperatures are encountered in the final fractionation and condensation in the secondary tower reflux drum. In operation of the system, the lower limit of reboiler temperature is held sufficiently high to insure stripping the poly furnace charge of C_1 and C_2 hydrocarbons down to 1½ mol per cent of methane and to supply sufficient heat to the secondary tower for good fractionation for tail gas composition. Heating medium for the reboiler is obtained by circulation of vis-breaker gas oil from the cracking unit. The upper limit of reboiler temperature is set by the capacity of the refrigerating system.

(Continued on Page 82)

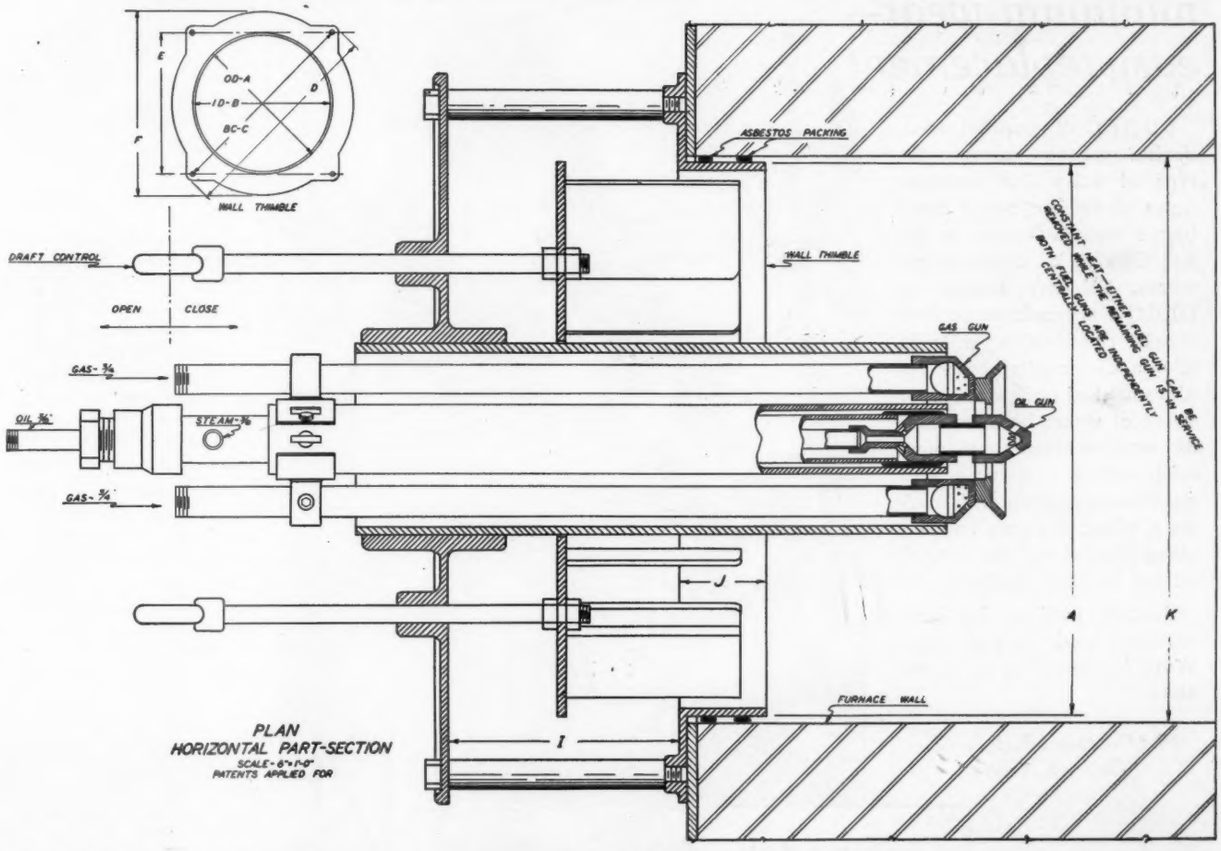
Of Course . . . . . .

JOHN ZINK BURNERS

fire the stills at Atreco . . . .

The burner inserts at Atreco are our own center fired type, where both oil and gas burn with a conical flame and produce the same heat pattern.

John Zink center fired burners have the unusual feature, in that either fuel gun is removable while the remaining fuel gun is in service. Illustration below shows the center fired type, combination burner, for natural draft.



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If this temperature is too high, compressors may not be able to handle the vaporized refrigerant from the condensers and higher pressures on the propane accumulators may result.

Control of the amount of reflux to the secondary tower is obtained by variation in the reboiler temperature. This practice is considered better than attempting to vary the reflux independently of the reboiler temperature by changing the temperatures of the two stages of refrigeration. Design temperature of partial condenser is just low enough that the cooled poly tail gas, at its equilibrium conditions of temperature and pressure, comprises largely methane, a smaller percentage of the C_2 hydrocarbons, and a low percentage of the C_3 hydrocarbons. Lower temperatures would add to the cost of the refrigeration while higher temperatures would result in loss of propane into the tail gas. This makes it advantageous for this stage of the refrigerating unit to be held within narrow limits of temperature and pressure. A greater part of the reflux condensing duty is done in the high-temperature stage, where refrigeration is less expensive than in the low-pressure stage.

The cooled poly tail gas stripped of its propane content in the refrigerating propane recovery system, is burned as fuel along with dry gas from other plant operations.

Like the furnaces of the combination unit, the poly furnace is of the forced draft type with combination oil and gas burners, and having normal heat liberation of 55,300,000 B.t.u. per hour with furnace duty of 36,360,000 B.t.u. per hour. It is 46 feet 5⅝ inches long, 14 feet, 3¼ inches wide and 15 feet 7¼ inches high, having a free area of 87.6 square feet in the radiant section and 148 square feet in the soaker section. There are two coils, each passing through the radiant and soaker sections, and having a total of 178 tubes (78 in the radiant section and 100 in the soaker section). All tubes are of carbon steel 0.5 per cent moly. This furnace is designed to operate at 1,600 pounds per square inch pressure and 1,030° F. at the outlet.

Plumbite Sweetening Units

Two plumbite sweetening plants have been provided, one for the Gray treated, stabilized gasoline from combination cracking and polymerization and the other for the straightrun gasoline. The former has six 500-bbl. settlers with an Atlantic patented pressure knot hole mixer for caustic and plumbite. The other is identical except the settlers are of 350-bbl. capacity each. The plumbite recovery system is the same as in the company's Philadelphia plant, which was described in the September 18, 1930, issue of The Oil and Gas Journal.

Purchased electric power is used throughout the plant, although all pumps vital to the operation of the plant are also equipped with steam turbines, which automatically cut in should the electric power fail. Two feeder systems with a carrier current hook-up are provided as a precaution against power interruption. The carrier current prevents the feeder system not in trouble from opening while allowing the other to go out of service. Power is brought to the plant at 33,000 volts, and then stepped down to 2,300 volts and 440 volts for distribution in the plant. Power consumption is 3,400 kw. per hour, with a power factor for the plant of 96.

The only major pumping load not on electric power is that handling the poly plant furnace charge. This installation consists of a National Transit 4¼ by 18 double end, horizontal, quintuplex reciprocating, plunger type hot oil pump, driven by a Skinner Unaflow condensing engine, operating at 26-inch vacuum. Another pumping installation of interest is that handling the fresh poly feed charge. This consists of two 15-inch, 17-stage Byron Jackson hydropress, centrifugal, motor driven units, operated in series.

Three separate pump rooms are provided for the plant, one for light oil pumps, another for the hot oil pumps, and the third for the intermediate reflux (low pressure) pumps.

Generation of steam for plant needs and emergency use is done by three Edgemore 400-horsepower boilers, equipped with combination oil and gas burners and turbine-driven blowers for forced draft. Normal steam load for the refinery is 55,000 to 60,000 pounds per hour. Boiler feed water is treated and softened, and preheated.

The plant has three separate water systems, one supplying boiler feed and cooling tower requirements; another supplies water for the several water coolers and condensers which are of the coil and box type, and the third supplies the fire protection system. Boiler feed and cooling tower requirements total approximately 1,000,000 gallons daily, of which 600,000 to 700,000 gallons is for cooling tower make-up water. This water is brought to the plant by a 10-mile ditch which was dug to a point up the river near Nederland where the water is fresher. Water for the other two systems is taken direct from the river at a point near the plant. This water is slightly salty. Approximately 5,000,000 gallons daily is required for the cooler and condenser system.

The cooling tower is of Foster Wheeler type with 16 motor-driven fans (eight on each side) for forced draft. The cooler tower has a capacity of 16,000 gallons of water per minute, cooling the water from 120 degrees to 90 degrees in summer heat.

IT'S LUDLOW ALL ALONG THE LINE—for positive closure—minimum wear—easy replacement

LUDLOW parallel seat, double wedge valves—the type of valve that positions gates directly opposite ports before wedging—are on active duty in oil fields everywhere. Oil men depend on LUDLOW valves because their simple construction to wide tolerances permits ready replacement of parts even after years of wear; because their 30° wedges insure rapid, powerful, secure closure, and quick, easy opening with minimum effort; because they clean themselves—no internal guides to cause foul-up.

Specify Ludlow for sure economy and dependability. Write for complete specifications.

Mid-Continent Supply Co.
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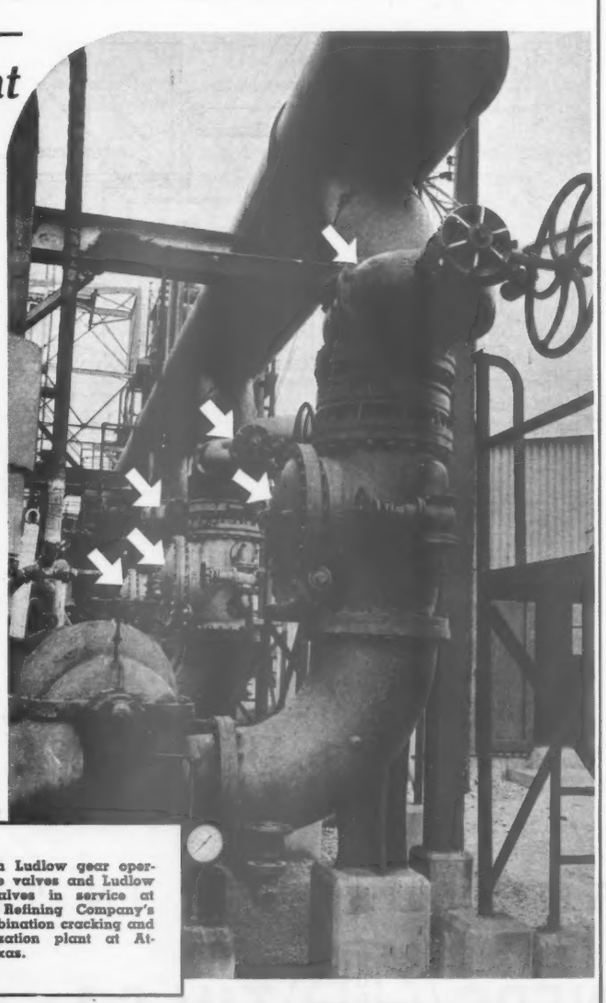

20 inch Ludlow gear operated gate valves and Ludlow check valves in service at Atlantic Refining Company's new combination cracking and polymerization plant at Atreco, Texas.

The LUDLOW VALVE MFG·CO· TROY·N·Y· SINCE 1866

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Hughes Tool Company takes this opportunity to congratulate the aggressive operators and manufacturers of Derricks for their leading part in giving to the Industry equipment in keeping with today's requirements for deep drilling.

HUGHES TOOL CO. • HOUSTON

Sound Conservation Measures Aiding in Schuler Recovery

By GEORGE WEBER

(Upper) *Between surveys the pressure bombs used in Schuler are carefully calibrated in the Conservation Board's workshop in El Dorado.—(Lower) Coming out of the hole with a pressure bomb. Pressure surveys are run on 25 key wells at Schuler each month, and a weighted average reservoir pressure is calculated on the acreage basis*

The application of sound conservation measures to production in the Schuler field of South Arkansas is increasing expected recovery figures for that field. Cooperation between the Arkansas Oil and Gas Commission and operators in the field has resulted in the adoption of improved production methods and withdrawal rates conducive to conserving reservoir pressure and reducing excessive gas production.

The Jones sand of the Schuler field is producing at present in 135 wells. Although the field is still in the development stage, with a total of 14 rigs active in drilling the Jones sand, its extent has been roughly defined. Past experience with withdrawal rates has given conservation engineers an insight into reservoir conditions; the present field allowable of 15,000 bbls. daily is believed to approach the critical rate of production under present conditions.

In addition to curtailment of crude withdrawals for promoting pressure maintenance in the reservoir, engineers are working on tests of individual wells in an effort to cut gas-oil ratios where excessive gas production is found. This work has already corrected production methods in a number of wells, although the work is only in its initial stages.

The pressure-production relationship in the Jones sand over the history of the field is illustrated in Figure 2. Since June, 1938, when production jumped to 18,583 bbls. daily, the reservoir pressure showed a consistent decline, accelerated during August, September, and early October, when production reached a peak of 21,729 bbls. daily.

Pressure Decline Arrested

Curtailment of withdrawals during October, to a daily average of 17,362 bbls. resulted in an indicated reversal of the pressure decline trend, from 2,784 to 2,825 pounds. This arrested decline following the October cut in allowable has indicated that 15,000 bbls. is close to the daily critical withdrawal rate. Accordingly, to investigate further into the pressure-production relationship, the state plans to maintain the field allowable at 15,000 bbls. daily and study the resulting pressure.

After a period of about three months, with the withdrawal rate held at the prescribed level, it has been determined that the pressure will continue to decline at an average of from 1 to 1½ pounds per day. This gradual decline, with the field on a competitive production basis, must be expected. Apparently, the active drive can be attributed to the gas in solution in oil, rather than to encroaching water.

Salt water has been definitely indicated in only two tests in the field: One of them is a dry hole off the north edge; the other is a producer near the north side. The water table has not been definitely determined from either of these wells, so that its movement, if any, cannot be traced.

In order to make the total field production, including new wells average 15,000 bbls. over the month, a new allocation schedule has been issued every two weeks, following the cut. For December and January, however, one allowable is set, taking into consideration those wells which will probably be completed during each month.

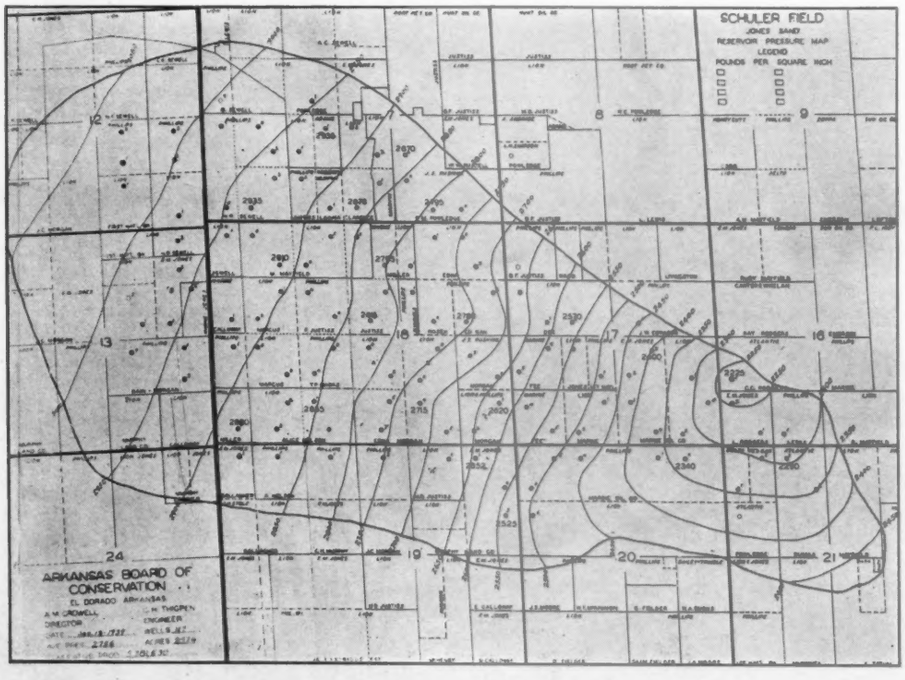


Fig. 1—Reservoir pressure map of Schuler field

Current Pressures

The latest pressure survey made in Schuler shows a drop of about 48 pounds from December 11 to January 13. This gives a drop of about 1.45 pounds per day over the 33-day period.

The pressure calculation for the January survey was changed from a mathematical to a weighted average. In each case, the pressure contour map, plotted from information on key wells, was used as a basis. Previously, the product of the average pressure in each 50-pound range area (see Figure 1), multiplied by the number of wells in each sector, and divided by the total wells in the field, was used as the average field pressure. However, the increased number of wells in the higher pressure area was detracting from the accuracy of the true trend, and the calculated pressure probably ran higher than the actual average figure.

A weighted average pressure will be used in the future. This is obtained on an acreage basis, consisting of the sum of all acre-pounds in each area enclosed by pressure contours, divided by the total field acreage. This procedure will eliminate the effect of new wells in the higher pressure areas; so long as the field limits remain constant, there will be a close approximation of actual average pressure conditions. On this basis the average pressure in the Jones sand on January 13 was 2,756 pounds as against 2,804 pounds on December 11, computed on the same weighted

basis. This approximates the estimates of the pressure trend at the 15,000-bbl.-per-day rate of production.

Southeast Wells

The southeast sector of Schuler represents the part first developed; therefore it has the longest production history; this sector has shown a consistent decline in Jones sand reservoir pressure. The Jones sand in this portion of the field is inferior to that on the north and west, showing numerous shale breaks and relatively lower porosity. This fact, coupled with the large withdrawals during the early part of the field's production life, has resulted in a decline of pressure sufficient to cause formation of a local gas cap in the sand.

The presence of the gas cap in that sector is showing up in substantially increased gas-oil ratios, aided by the decline in allowable effective during the past few months. High gas-oil ratio wells are also found in other sections of the field, where wells were perforated too high in the Jones sand. The latter class of wells is being regularly kept to a minimum, however, by voluntary squeeze jobs.

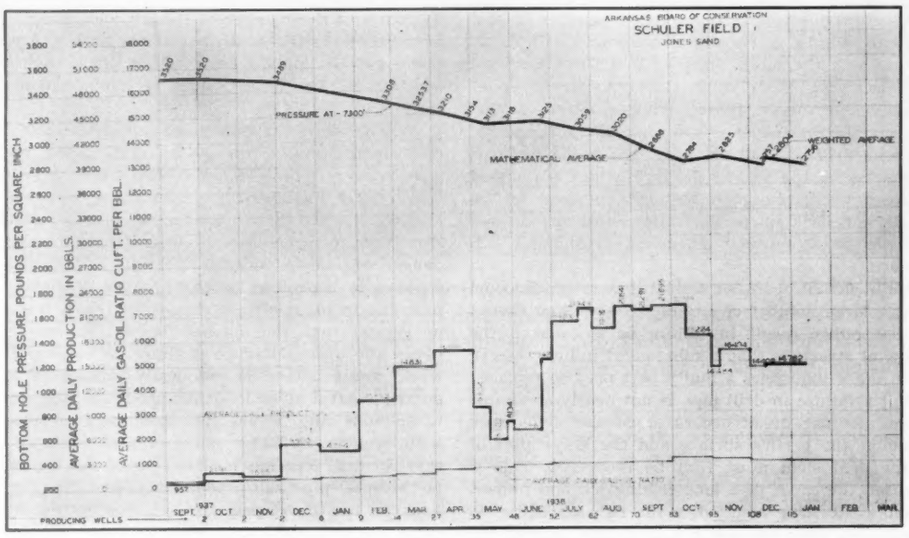


Fig. 2—Bottom-hole pressure, production and gas-oil ratio

The wells in the southeast section of Schuler, however, presented a problem, as their methods of completion were correct. Conservation engineers, working in collaboration with petroleum engineers of the various companies, approached the problem from the angle of flowing practices. At wells which showed gas-oil ratios in excess of 2,000 cu. ft. per barrel, individual tests were run on rates of flow.

It was found that stop-cocking these wells, and producing them for short periods each day has come closest to solving the high gas production problem. About 10 wells showed the same characteristics. A test made on one gives a good example of the performance of the group in general. This well had a ratio of about 3,000 cu. ft. per barrel of oil. The well was shut in over night, and opened on a 20/64-inch choke. The rate of flow was at an average of between 700 and 800 bbls. per day, and the well was allowed to flow for about four hours, during which its allowable for the day was made.

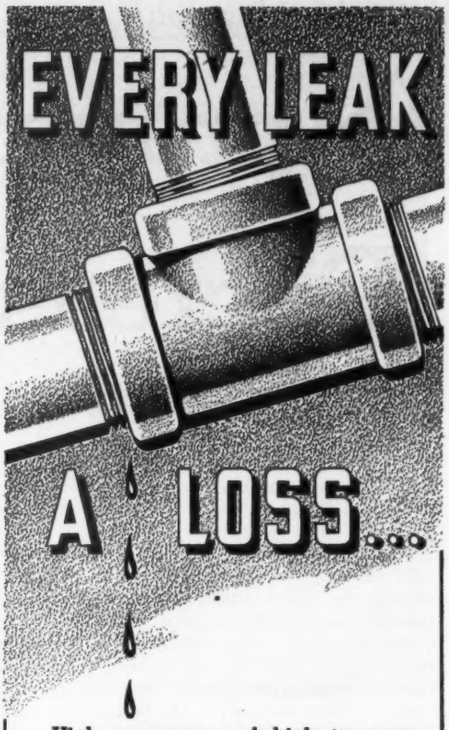
An orifice meter, installed in the gas line behind the separator, recorded the gas flow continuously during the test. For the first two hours, the gas flow was light, as the well produced oil steadily. However, after about 2½ hours of flow, when approximately 60 per cent of the oil allowable had been produced, the gas began coming in, and the gas production rose to an excessive figure, where it remained for the duration of the test period. Repeated tests on successive days showed similar results.

It is believed, that during the shut-in period, oil migrates to the well bore, and the first two hours' production consists of this oil, with the gas pressure behind it. Production on the stop-cock principle has resulted in a reduction in gas-oil ratio of 50 per cent. The tests are in their early stages, however, and a further reduction may be possible. There is a possibility that producing the well for a shorter period (at intervals of less than 24 hours) may circumvent the necessity for producing the well after gas has broken through, thus cutting the gas-oil ratio still further. It is known that the rate of build-up of fluid levels in shut-in wells decreases with time, and that possibly, during the last few hours of the present shut-in period, the migration of oil to the well decreases considerably. Future tests, made at shorter intervals and for shorter individual flowing periods, still averaging the same monthly production, may bear out this assumption. However, there is an economic factor of increased labor to be considered in irregular production methods. An optimum system of producing these high gas-oil ratio wells, where added man-hours justify increased pressure conservation, may be worked out in the field.

The danger of producing wells at high rates of flow is recognized by engineers working on this problem. For the present, however, the method is considered the best to follow. The possibility of salt water intrusion in the southeast section of the field is unknown at the present time, but the absence of any indication of a water drive minimizes the hazard. It is expected, that by the time this danger is evident, a system of pressure maintenance throughout the field may be in effect.

The beneficial effect of individual flowing tests on wells in the gas cap area was already evident in a reduction of gas-oil ratio for the whole field during October, and the full effect of the improved flowing conditions is reflected in a consistent decline in the ratio since that date.

While the presence of a water drive in the Jones sand is still debatable, few believe it to be effective. The increase in average bottom-hole pressure in November, following the latest production cut was thought to be a result of such a drive, but the pressure reaction over the subsequent period does not support the supposition. As shown in Figure 2, which is a pressure contour map of the field, the southeast section where the Jones sand is low both as regards to pressure and dip, is the area where water drive may be first expected to show its effect.



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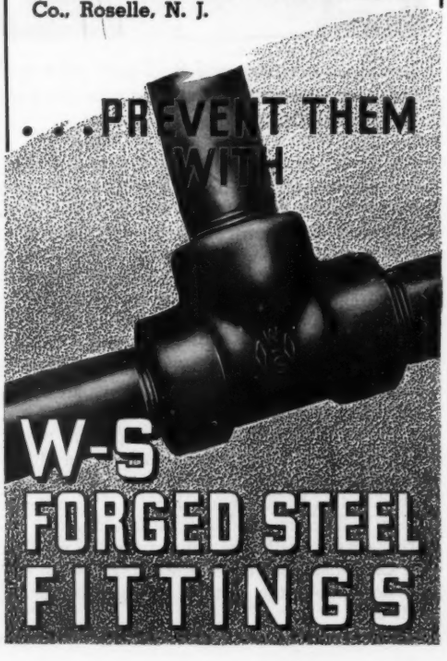
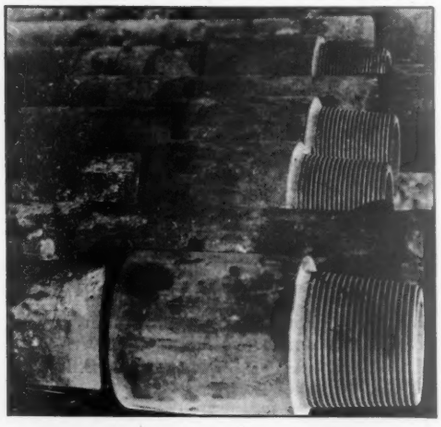


Improvement in Tool Joints Decreases Pipe Break-offs

By HARRY F. SIMONS

The concerted effort of drilling contractors and manufacturers of drill pipe and tool joints during the past five years to eliminate the failures occurring in the last engaged thread has developed several methods that are successfully reducing the number of fishing jobs due to this type of failure. Tool joint and pipe manufacturers and drilling contractors have cooperated closely on this problem, both advancing new ideas on design and application. Two major changes have been made; the modification, and in some cases, a radical redesign of the thread form; and mechanical or welded reinforcing to remove the strain from the last engaged thread. Some methods use both of the above.

The drill stem on a rotary rig is a most important feature, not only because of the work it performs but because of its cost. A 6,500-foot



Pin end of a string of 5 9/16-inch pipe with joints that were shrunk on; this pipe has seen considerable service

string of pipe with tool joints costs approximately $19,000 and at one time could be expected to drill only about 20,000 feet of hole before it approached a dangerous condition. At the present time operators whenever possible are using smaller, less costly pipe and the footage on all types of pipe and tool joints has shown a marked increase. Strings of pipe are now in use that have drilled 100,000 feet of hole, the length of service depending to a great extent on the locality in which it is used. The Gulf Coast and California are easiest on drill pipe, the Mid-Continent is fairly severe, and Illinois the most severe at the present time.

Study of drill pipe operation led to a change in conception of its proper function. It was once considered as "pipe" where now it is regarded as a very delicate machine despite its simplicity and rather massive construction. During the past decade there has been a decided change in not only the design but the method of operation of the drill stem.

In its simplest terms the drill stem is a long tube composed of sections joined together by tool joints, the lower end terminating in a drill collar to which the bit is attached and the upper end terminating in the kelly joint which is driven by the rotary table. By applying a torque to the kelly the bit and stem are rotated, the formation being drilled is cut away by this action and carried out of the hole by the fluid which is pumped down inside the pipe, through openings in the bit, and back up to the surface through the annular space between the drill pipe and the well bore.

In actual operation the drill stem is subjected to a large number of strains, stresses, and shocks that either result in failure or so weaken the metal structure that a subsequent failure results. In other industries a faulty part may be replaced but a failure in drill pipe is not nearly so simple because the break occurs at considerable depth under the earth's surface and the lower part of the drill stem must first be recovered. This is often the cause of a long fishing job and numerous cases have resulted in the fish not being recovered, thus causing a loss of the pipe in the hole and the added expense of sidetracking the fish.

Torques and Shocks

In addition to the torque applied to the stem for turning the bit, other factors inducing breaks are: the wobbling of the drill stem due to its being crooked or its being in compression due to excessive weight carried on the bit; shock due to the bit becoming stuck and rotation of the upper part of the stem continued, reverse shock when it finally breaks loose, sudden application of too much weight on the bit, and the hitting of a ledge or tight spot in the hole while running in of the drill pipe is in progress; harmonic vibrations due to the pulsation of the reciprocating mud pump, bouncing and rotation of the bit. Besides the above mechanical effects there is also the action of the mud-laden fluid carrying abrasive particles on both the inside and the outside of the pipe; mud-cutting of the bond between the tool joint and pipe results from the turbulence caused by the fluid passing over the offsets at high pressures and speeds.

The above is a partial list of the strains set up under normal drilling conditions. When drill pipe becomes stuck it is subjected to much more abuse in the efforts to get it loose. Attempts to rotate the drill stem result in a permanent distortion of the pipe body and probable weakening at the tool joints. Jarring of the pipe may also weaken it at an unseen point that will later develop into a fishing job.

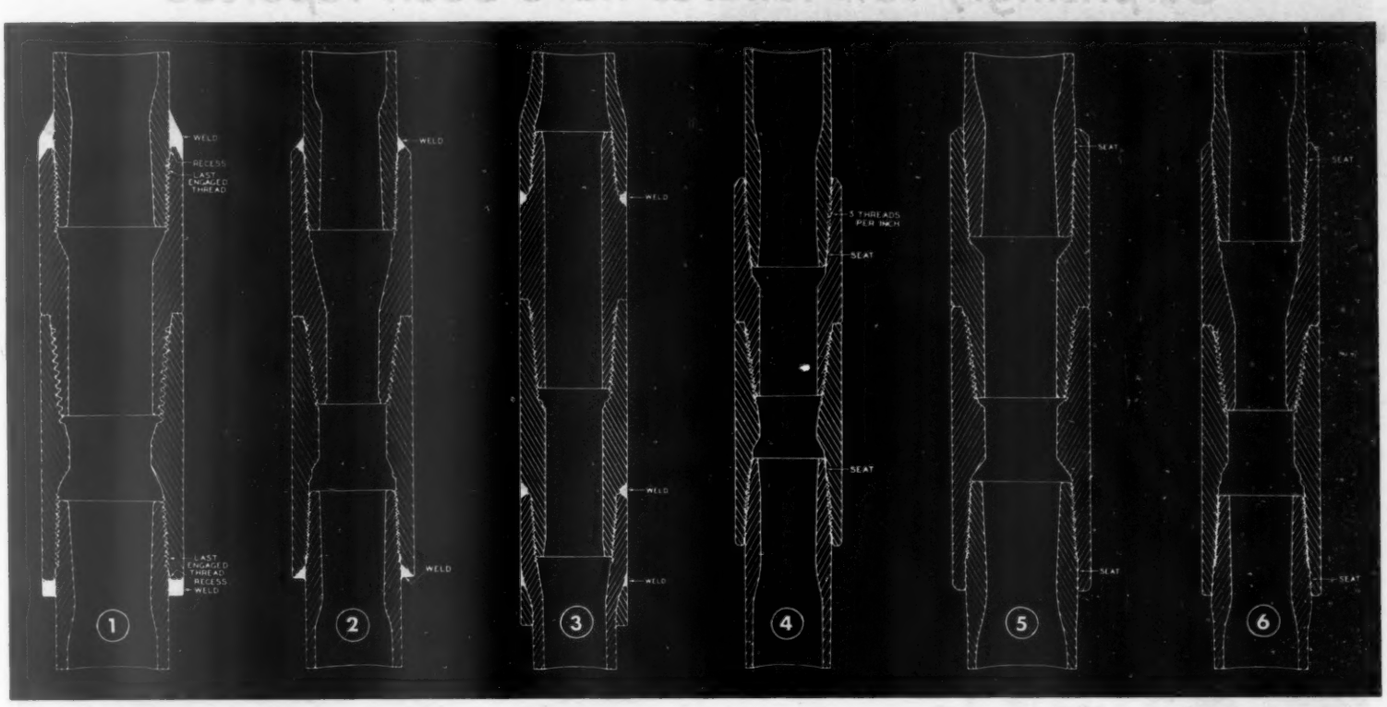
Manufacturers have sought to meet the demands of the drilling industry by developing drill pipe and tool joints that will withstand the destructive influences to which it is subjected. Originally the drill pipe was coupled together with collars made of the same material as the pipe body. With the introduction of the tool joints many fishing jobs were eliminated. A steady reduction in the number of fishing jobs, and the increase in the life of drill pipe has been due to the better design and materials in manufacture and changes for the better in the manner of operation.

While failure may occur at any point on the drill stem, including the bit and kelly joint, the most common point of occurrence, and the spot which gave manufacturers and users the most trouble was at the thread connection between tool joint and pipe. To eliminate this source of danger has taken considerable time and it now appears to be solved as the number of fishing jobs due to break-offs at this point seems to be no greater than the number due to failures between the upsets. Failure is bound to develop at weak points and it is practically impossible to build a shaft 2 miles long that would be uniform throughout and would not eventually develop some trouble. A wider range of tool joints and types of drill pipe has been developed but the internal upset pipe still predominates and the problems it has developed receive most attention. Other types present problems that are for the most part variations of those common to the internal upset pipe and its tool joint.

Studies of break-offs disclosed an interesting feature. By cutting a test groove through the faulty tool joint and upset, stopping for an examination of the specimen after removing each layer, it was discovered that in many cases the thread pattern was discernible as a fine line when only a thin layer of the wall section was still in place.

In the solving of this problem the cause of the break was first studied. Most of the failures were observed in either the last engaged thread or the first full stand-off thread; as the threads are located at a point where the pipe is fully upset, re-

New 6⅝-inch joints conventionally welded on pipe



Diagrams of some of the tool-joints commonly used at the present time: No. 1, A.P.I. joint, welded; No. 2, counter-bore welded joint; No. 3, external upset pipe shrunk on tool-joint and welded; No. 4, the seal ahead of the coarse, square thread prevents entrance of fluid after the joint is installed by shrinking; No. 5, seats on joint and pipe brace the thread section; No. 6, joint shrunk on the pipe with a seat for reinforcement of the threads. All of these joints with the exception of No. 3 are manufactured for external upset, internal flush pipe.

duction in thickness due to the presence of the thread could scarcely be blamed for the failure. Following is the thickness of the walls and upsets of one type of Grade D drill pipe manufactured at the present date:

Size. O.D. (inches)	Weight lbs. per ft.	Wall thickness (inches)	Upset thickness (inches)
3½	13.30	.368	.857
4½	16.60	.337	.797
	18.10	.373	.891
5⅛	22.20	.352	.828
	25.25	.415	.885
6⅝	25.20	.330	.861
	31.90	.432	1.049

While the above are the specifications for a pipe currently manufactured, they afford a substantially accurate comparison of the thickness of the upset in relation to the body of the pipe manufactured, several years ago. Threads used for attaching the tool joints were V-shaped, 8 threads to the inch and three-quarters inch taper to the foot. Depth of the threads was .100 inch on the V-type thread and .07125 on the modified thread having rounded crests and grooves. The breaking at this point could scarcely be attributed to the mere absence of that much metal when the thickness of the upset was considered.

It was finally determined that two steps in the manufacture of the pipe might be causing this: the upsetting of the pipe and the cutting of the thread. During the upsetting process the molecular structure was disturbed and this was aggravated by the cutting of the thread which caused submiscroscopic cracks that later developed visible ones when the pipe was subjected to the jarring vibrations and wobbling encountered in service. Efforts to cure this trouble by remodeling of the threads to reduce the V by rounding the crest and grooves, voltuntary reduction of the tolerances allowed in the tool joints and pipe, and by different treatment during and after upsetting were not met with a great amount of success although they undoubtedly did reduce the number of failures. Both makers and users started to find the method by which this inherent zone of weakness could be strengthened and some of the numerous types of tool joints on the market today are the outgrowth of this investigation.

First welding of the tool joint and the first mechanical bracing of the last engaged thread came close together. The welding got its impetus from the desire of contractors to increase the footage of the pipe. After drilling three 6,500-foot holes the tool joints were generally worn so thin that there was danger of the shoulder slipping through the elevators while hoisting the pipe. Some of this early welding was by the acetylene method but electric welding of the joints to the pipe soon became prominent.

Contractors and field men soon learned that there were surprisingly few break-offs in pipe that had been welded. This was partially due to the fact that the pipe that had been fractured in installation of the joints failed shortly after being put into service. The bracing due to filling the space between the pipe and the tool joint from the gauge point to beyond the tool joint end reduced the strain on the last engaged and the stand-off threads. Distance from the gauge point to the end of the coupling was .6405 inch and this bracing by filling with metal had a very desirable effect.

The next step was to adapt the welding process to new tool joints on new pipe. Investigation proved only a small part of the metal was affected by welding and the thickness of the upset more than offset this. Application of tool joints was often performed in a none too scientific manner and the joint was not tight when the allowed number of stand-off threads were present.

Stand-off for various size joints is as follows:

Specified nominal stand-off	Maximum stand-off	Minimum stand-off
4½	6½	4
5	7	4
6	8	4
7	9	5
8	10	6
9	11	7

More attention was paid to installation and a machine which accurately registered and controlled the torque being applied began to find favor with all concerned. These machines turned slowly, about 2 r.p.m. Welding technique also advanced and it was found that the use of a too heavy rod caused too much burning of the metal in the upset of the pipe and weakened it slightly. One manufacturer uses the following torques when installing tool joints:

Size (inches)	Max. torque (ft. lbs.)	Min. torque (ft. lbs.)
2⅜	4,500	3,500
2⅞	6,500	5,500
3½	9,500	8,500
4½	13,000	12,000
5⅛	16,000	15,000
6⅝	17,500	16,500

When using the above torques and then welding the pipe and tool joint, it has been found that satisfactory service will result and the possibilities of a break at this point are greatly reduced. Surprisingly few failures have been recorded.

The purpose of the stand-off threads was to permit further making up of the pipe when it was put into service; as this was just opposite to what was desired when the pipe was welded, more attention is now paid to the torque than the stand-off threads. However, great care is taken when installing tool joints of all types as it has been found that while the tolerances allowed were close enough as an average, a tool joint of maximum minus tolerance and a pipe of maximum plus tolerance did not fit satisfactorily. The same is true of the other extremes.

Tool joint manufacturers prefer to install their joints in their own shop or in a machine shop in which they have confidence. They ask that they be permitted to supervise the installation operation when the joints are being applied elsewhere. This is because they have found that approximately 15 per cent of the trouble develops because of some error during installation; when supervising an operation they can prevent many potential breaks because of their experience in the matter.

The welding of the tool joint boxes required that a square shoulder be made for engaging the elevators. This was facilitated by the invention of a copper collar attached to the pipe from one-half to 1 inch from the box shoulder. The electric weld was then applied to the pipe and the space between the collar and shoulder filled in, some of the weld being forced between the pipe and the tool joint.

Assurance that the space between the tool

(Continued on Page 95)

"Surprisingly few failures have been reported"

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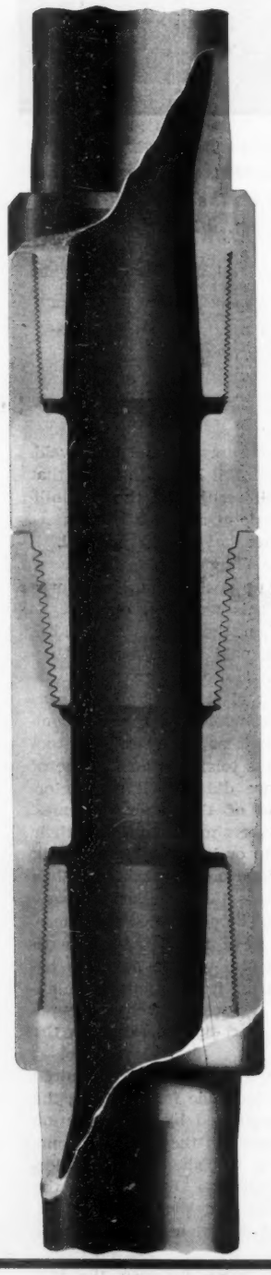

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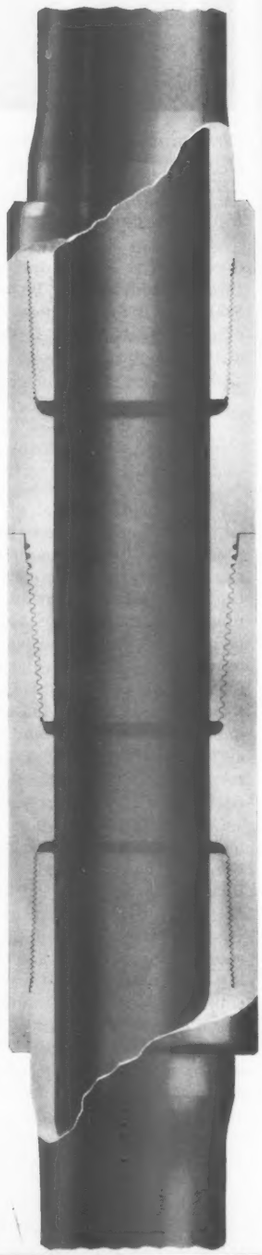

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joint recess and pipe was adequately filled was lacking in the conventional type weld. The manufacturers decided to build a joint that was designed for welding and to develop a technique that would assure a firm bond at the point desired with a minimum weakening of the metal structure.

Preheated Before Welding

For this process the tool joints have their recesses counterbored to a 45-degree angle and then are screwed and bucked on to the pipe. Excess

Box end of a counter-bore welded joint after excess weld has been removed

lubricant is first blown from connection after which it is preheated to 300° F. before welding. Preheating is checked with an alloy stick which melts at the proper temperature; failure to preheat may cause a crack in the first bead that will affect the entire weld. For welding, an all-position, reverse polarity, coated electrode which meets Class 1 welding specifications is used. Two types of rods are used at one shop, the first being a rod which produces a minimum of undercut with a tensile strength of 59,000 to 75,000 pounds per square inch, yield of 44,000 to 58,000 pounds per square inch, and an elongation of 20 to 40 per cent in 2 inches; the second type rod produces a weld having a tensile strength of 62,000 to 81,000 pounds per square inch, yield of 43,000 to 64,000 pounds per square inch, and an elongation of 15 to 30 per cent in 2 inches.

Two beads are run on the box end, the first being made with a three-sixteenths rod of the first type and the finish bead being run with a three-sixteenths rod of the second type. The weld is cleaned to remove the slag after the first bead has been run to prevent weakening of the entire job by contamination. The finished weld projects beyond the shoulder of the tool joint and this excess metal is removed with a special cutting tool that absolutely prevents any undercutting of the pipe. A scratch of any magnitude in the pipe at this point would be almost as bad as the zone weakened by the threading.

Two beads are also run on the pin end with the same precautions taken against slagging. According to Orville T. Barnett (The Oil and Gas Journal, August 18, 1938, page 62) the running of two beads has a beneficial effect as there is a certain refining action resulting from multi-pass welding due to the successive welds normalizing the layers beneath with a consequent increase in the weld ductility. Care is taken that a minimum of the pipe body is affected by the welding and after studying samples cut from the tool joint and pipe connection it has been found that a properly applied weld does not weaken the pipe to any appreciable extent in view of the thickness of the upset.

Much that has been learned about welding of pipe during the installation of the above type tool joint is applicable to the welding of old pipe or the rebuilding of the shoulder on the box after the joint has been worn down by use. A light rod and the weld put on in successive thin layers seems to be preferred; much of the success of welded pipe will always depend on the knowledge and ability of the welder.

While some companies were concentrating on the successful welding of tool joints others were developing a mechanical bracing which removed the strain from the zone weakened by threading and placed it above or below this point. Practically all of these methods require a pipe designed for the particular tool joint involved. All of them have been successful in reducing the number of breaks at the last engaged thread. They also have a similarity with welded joints in that the manufacturers insist they either install or supervise the installation of these joints. The successful operation of this type pipe and tool joint is greatly dependent on the proper installa-

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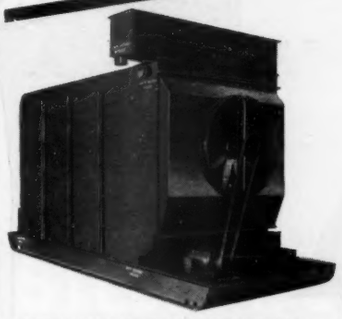

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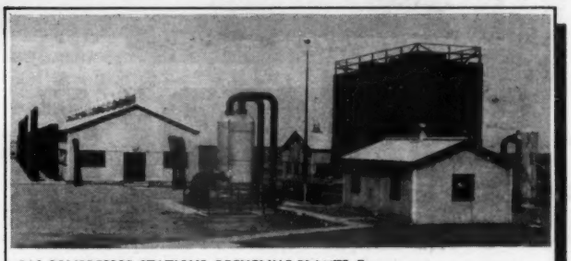

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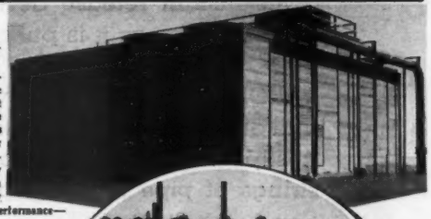

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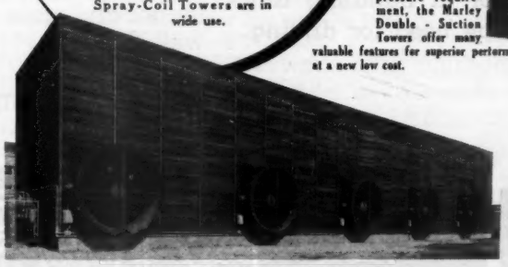

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tion by an experienced and qualified mechanic, and the manufacturers are avoiding the possibility of as many complaints of failure as possible.

The first of these joints has the exterior of the drill pipe slightly upset to provide for the machining of a tapered seat; a companion seat on the tool joint forms a seal and brace when the joint is fully made up. The recess in the joint is made considerably longer to allow for the counterboring. The joints after being cleaned and doped are spun on to the pipe hand tight after which they are bucked up in machines. The tool joint is turned one more revolution before the counterbore contacts the seat on the pipe, after which it is made up at least one more turn. Torque demanded is the same as in tool joints installed for welding, and in case too much torque is required, or there is less than one thread standoff, the joint is removed and another joint substituted for it. This joint gives a positive seal and has been found to hold it satisfactorily.

Another type tool joint utilizes the expansion of tool joint metal when heated and the shrinking when cold to effect a mechanical brace and seal against leakage. This joint also requires a pipe with a slight external upset that is machined to form a seat. The tool joint which has an extra long, accurately machined recess is heated only in the section desired. The pipe threads of tool joint and drill pipe are well doped, then the joint screwed on the pipe hand tight and allowed to cool. The shrinking together of the two machined surfaces effects a seal against leakage. The standoff is then observed and marked and the joint made up approximately 2½ turns more at which time a torque of from 12,000 to 15,000 foot pounds is required to complete turning. As the joint is turned a predetermined amount after cooling, any unsuitable fit can be discovered while the joint is still warm and the joint easily removed. As a check on this type joint the manufacturer punch-marks the joint and pipe and checks the pipe after it has seen considerable service to detect any tendency of the joint to turn. Very little turning has been noted although some movement (a fraction of an inch) has been noted on some joints. This small makeup is claimed by the manufacturer to be desirable.

Still another type joint has three principal features: replacement of the V type thread by a thread which for all purposes is coarse (5 threads per inch) and square, a seal ahead of the threads made by a broad face on the inside of the tool joint and corresponding face on the pipe, and utilization of the expansion and shrinking of the metal. In this joint the threads are not required to act as a seal as the ground seat prevents any fluid from entering the threaded section; elimination of the notched thread and full contact throughout the thread length prevents breakage at the last engaged thread; there is no creeping because of the firm bond established between the threads by the shrinking process. No bucking machine is required for installation.

This joint is installed by the manufacturer, but replacements may be made in any field machine shop. For installation the joint is cleaned and dried but not doped; it is then screwed on the pipe hand-tight and reference marked. The joint is then removed and heated to 650° F., after which it is screwed on the pipe to the hot reference-mark position. It is then air-cooled.

A fourth joint requires internally threaded, externally upset pipe into which the tool joint screws under controlled torque with a bucking-on machine. The bond due to the thread pressure is aided by welding at the V made by the taper on drill pipe and tool joint. The whole gives a streamline effect that can be used well with pressure-control heads. For ordinary drilling a shoulder for elevating the pipe is provided by the streamlined external upset of the pipe just below the box.

With the exception of the last type joint, and the counter-bore weld type, none of these joints is welded at the time of installation but rebuilding by the welding method has no harmful effects. All of the joints except the latter are of the internal upset variety but only slight variations of the joints described above, are required for similar installations on external upset, internal flush pipe.

Some drilling-in heads require external flush pipe. In this case the pipe used is internally upset and the threads cut on the inside instead of out and the tool joint screwed into the pipe ends. One joint of this type has a taper cut on the outside of both the pipe and the joint and this space is filled with a weld; a second heats the pipe before screwing-in of the tool joint, the assembly then welded the same as the above; a third uses a dove-tailed seat.

Advances in drilling have required the development of all of the types of drill pipe and tool joints described and many others. While internally upset pipe with the tool joint screwed on still predominates, the other types are finding many uses. The introduction of the externally upset pipe to allow for internally flush assembly of drill pipe and tool joint was practically demanded by the use of retractable core barrels and bits. The present tendency is to streamline as much as possible as pump requirements are thus reduced and the cutting of the pipe due to sand in the mud is also lessened.

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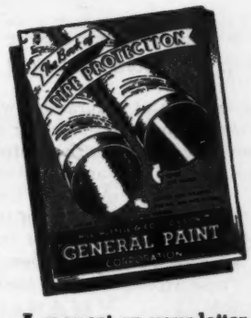

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Gas Injection and Natural Gasoline Plant Operation

By HENRY N. WADE
Parkhill-Wade*

For the purposes of this paper I am using the term "gas injection" to cover any operation involving the forcing of gas into a producing formation for the purpose of facilitating, or increasing the ultimate total recovery of oil from the formation. Considering the conditions in the producing formation, the source of the injected gas is immaterial. In other words, regardless of whether the operation falls in the class of "pressure maintenance" or of "repressuring," the act of injecting gas into the formation produces the same results as far as the formation conditions themselves are concerned. Depending upon the relations between the producing factors, which have been discussed, the injection may retard the rate of pressure decline in the formation, or may stop such decline altogether, or may actually raise the formation pressure.

Although the benefits of gas injection are felt most directly in the production of crude oil, the

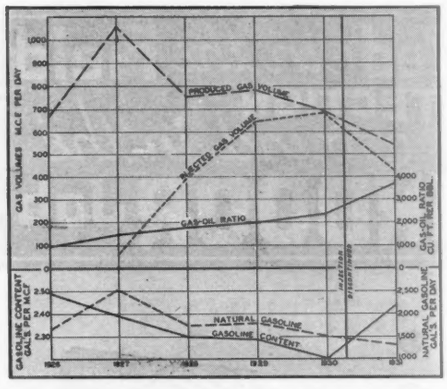

Fig. 1—Record of typical injection project

conservation of natural gas which it affords will obviously have far-reaching effects on natural gasoline operations. These effects are of four different types, and are as follows:

1. Effect on quality of the wet gas.
2. Effect on quantity of the wet gas.
3. Effect on the life of the plant operation.
4. Effect on plant design.

These effects will be discussed in the order named.

Effect on Quality of Wet Gas

It is obvious that if dry gas is returned, or injected from another source, into a producing formation for a long enough time, the gasoline content of the wet gas taken from the formation will gradually decrease. If such an operation were continued until the formation had been completely stripped of its volatile liquid contents, the returned gas would of course finally circulate through the dry formation without any change in its composition. Thus the first effect we may expect is a gradual reduction in the gasoline content of the wet gas, and this general theory is supported by experience.

A Mid-Continent operator reports the following data from a field in North Central Texas. The oil pool covers about 1,500 acres, and produces 41° A.P.I. oil from a sand 15 feet thick at a depth of from 1,150 to 1,200 feet. The structure is made up of lenses and interbedded shales, with consequent irregular porosity and permeability; thus the nature of the formation favors channeling between input wells and producers. The effect of such channeling was minimized as far as possible by careful selection and mechanical treatment of the wells. The field has no water-drive; the gas injection was used for the purpose of increasing oil recovery.

Dry Gas Injected

Figure 1 shows the operating results for the years from 1926, just before gas injection was started, to 1931. At the beginning, only the dry gas from the gasoline plant was injected; shortly thereafter gas from an outside source was added.

The most significant points illustrated on this chart, from the standpoint of the natural gasoline plant operator, are the increase in the quantity of gasoline produced, and the lengthening of the plant operating life. In 1926 the production was at a low ebb; operation would have been discontinued in a few months. After gas injection was started the production of gasoline increased sharply, and did not reach the low level of 1926 until about four years later. This operation shows, on a small scale, the principal effects of gas injection in a depleted field on gasoline plant operation.

Two other gas injection operations, now 12 years old and 6 years old, respectively, have each shown a gradual decrease in the gasoline content to practically 80 per cent of the initial value. Based upon the assumption that the rate of oil production has been kept constant, these same properties have shown an increase in gas-oil ratio of about 30 per cent, so that the gasoline production from the gas is now about 104 per cent of the original production. The operators report that both of these gasoline plants were about to be shut down when the gas injection was started; however, due to the improvement in production caused by the injection program they are still in profitable operation.

Still another operator reports a field about 15 years old, in which the gasoline plant was shut down about two years ago, on account of exhaustion of gas. Injection of gas from an outside source was started last year, with the result that the produced gas volume has now built up sufficiently to permit profitable operation of the plant. In addition, the rate of oil production has been exactly doubled by the gas injection.

In two of the most recent applications of gas injection, respectively, about 10 months and 18 months old, no appreciable change has been observed yet in the quality of the gas produced; if anything, the gasoline content has tended to increase. This is undoubtedly due to more careful selection and management of wells, since all production has been shifted to wells showing the lowest gas-oil ratio in order to conserve compressor horsepower.

In the older of these two applications, the gasoline content of the gas, which is trapped out of the oil at about 500 pounds per square inch pressure, has actually increased from 0.365 g.p.m. to 0.436 g.p.m., while the gas-oil ratio has decreased from 6,230 cubic feet per barrel to 5,060 cubic feet per barrel. These two tendencies about offset each other, so that the gas now yields 2.205 gallons of gasoline per barrel of oil produced as compared with 2.272 gallons per barrel before gas injection was started. Thus, the gasoline plant is producing practically the same amount of gasoline from

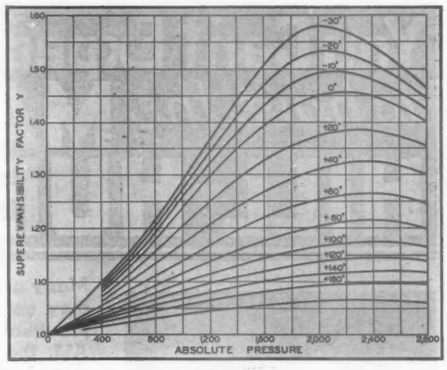

Fig. 2—Deviation of methane from Boyle's law, deviation vs. pressure

about 19 per cent less gas, the quantity of crude oil produced remaining constant in this case. In time, of course, the normal trend toward lower gasoline content and higher gas-oil ratios will set in.

Effect on Quantity of Wet Gas Produced

It is evident that, as liquid materials are withdrawn from the formation, the injected gas will have increasing opportunity to channel or by-pass from the input wells to the producing wells through the drying formation, and that therefore, the gas-oil ratio in the producers will eventually tend to increase. This tendency can be offset for a time by progressively taking production from wells lower on the structure, but this can be done only out to the limits imposed by edge-water.

This tendency is clearly shown in the data presented in Figure 1, where the gas-oil ratio is seen to increase about 38 per cent over the period covered.

From the standpoint of the natural gasoline

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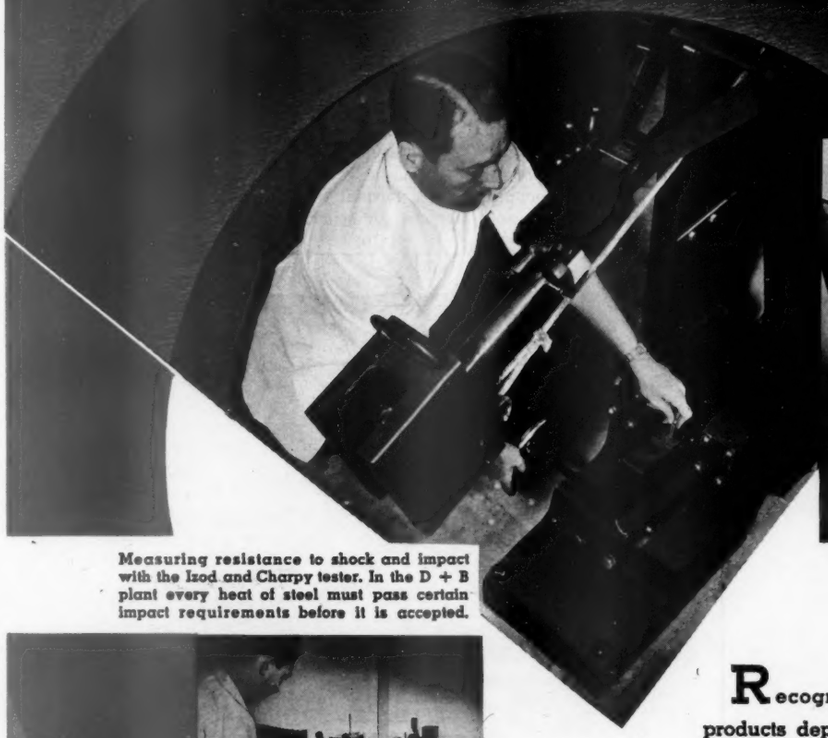

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plant operator, this tendency will at least partly offset the decline in gasoline content of the gas, so that his plant production will tend to remain nearly constant throughout the life of the field. assuming the rate of oil production is nearly constant.

Effect on Life of Gasoline Plant Operation

In all of the above discussion it is apparent that gas injection offers a means of bringing dead properties back to life, and of greatly prolonging profitable operation in a new field if pressure maintenance is started early.

Assuming that the cost of the injection operation is justified by savings and increased recoveries in the production of oil, so that no part of it is chargeable to the gasoline plant, the plant operator is automatically saved the expense of installing compressors for gathering gas until the structure is nearly completely exhausted of both gas and oil.

Finally, if the gasoline plant operator shares in the revenue from the sale of dry gas, it is obvious that the gas saved by return to the formation affords a reserve of future income which may permit profitable operation for many years beyond the time when the plant would have to be shut down if the gas were wasted.

Selection of Trapping and Gasoline Plant Pressures

The selection of operating pressure conditions will, of course, depend on the local circumstances surrounding each operation. In general, the cheapest installation will result if a maximum of gas is separated from the oil at the highest possible pressure, since the suction pressure at the compressors determines the horsepower required to pump a given volume against a fixed discharge pressure. For example, assume that the wells produce with a gas-oil ratio of 5,000 cubic feet per barrel, and show a well-head pressure of 2,000 pounds per square inch. The primary trap pressure might be 1,500 pounds per square inch, in which case something like 4,000 cubic feet of gas per barrel would be taken out of the mixture at this pressure, leaving only about 1,000 cubic feet per barrel of gas to be removed by separators at lower pressure. The compressor horsepower required to pump this 80 per cent of the total gas from 1,500 pounds suction to the injection pressure of say 3,000 pounds, would be only about 40 per cent of that required to raise it to the same pressure if the primary separation were made at 600 pounds.

In this connection I should mention that the phenomenon of "retrograde condensation" may prohibit the use of primary trap pressures much over 1,000 pounds, unless for economic reasons there is no objection to stripping the oil of some of its lighter liquefiable fractions and returning these materials to the formation. As a matter of fact, such return may actually be desirable for the purpose of reducing the viscosity of the oil in the formation, and thus facilitating its flow to the producing wells. "Retrograde Condensation" simply means that above certain limits of pressure the familiar tendency of vapors to liquefy with increasing pressure reverses itself, so that increasing pressure beyond these limits causes more and more useable liquid to remain in the gas. Thus, under normal trap temperatures, the liquid content of gas separated from a given oil at, say 1,

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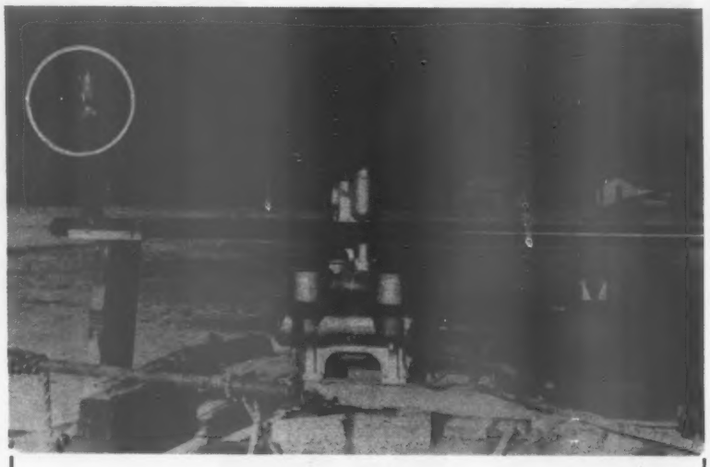

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500 pounds pressure, will be higher than the content of the gas separated from the same oil at the same temperature, but at, say 600 pounds trap pressure. This effect varies with the composition of the gas-oil mixture, and with the temperature of separation. So far there is no exact method for calculating the magnitude of the effect, even if the gas-oil composition is accurately known; hence, it must be determined by tests. An excellent article on this subject was published in the September, 1937, issue of Industrial and Engineering Chemistry, by D. L. Katz and K. H. Hachmuth.

In the example under discussion, the oil from the primary separation would be run to a secondary separator at lower pressure, where most of the solution gas would be removed and processed through the gasoline plant. The pressure of this secondary separation might be determined by requirements for delivery to a pipe line for sale; otherwise, it would be selected to give a satisfactory and economical operating pressure for the plant, in the range of, say 150 to 500 pounds. It might then be necessary to pass the oil through one or two additional separators at successively lower pressures, in order to reduce the gas content and vapor pressure of the oil to a point sufficiently low to prevent unreasonable storage and handling losses. The vapors from these low-pressure stages would, of course, be recovered for extraction of gasoline. As a final complication, particularly with high-gravity oils, it may be necessary to pass the crude through a stabilizer to remove excess butane and propane, in order to give it a satisfactory vapor pressure.

Depending upon local market and producing conditions, the scheme of production just outlined can obviously be rearranged in many ways. For instance, if the natural gasoline content of the gas is low, and the crude gravity also low, the viscosity-cutting effect secured by returning wet gas to the formation may be more valuable than the gasoline which might be produced. In such a case the gas would simply be pumped back without treatment. Here, also, the principle of separating as much gas as possible at the highest pressure possible will lead to the cheapest installation.

Compressor Horsepower Requirements

At pressures in excess of about 600 pounds per square inch the so-called "super-compressibility" or Boyle's law deviation begins to become noticeable in its effect on compressor horsepower; this effect reaches a maximum at pressures around 2,500 pounds per square inch, and then decreases at higher pressures until it practically disappears at pressures in the neighborhood of 4,000 pounds. The effect of the deviation is to increase the amount of gas which can be pumped by a given amount of horsepower, since a given quantity of gas occupies less space at the higher pressures than the uncorrected application of Boyle's law would indicate. Exact methods of figuring the magnitude of this effect have not been worked out, and no practical information from high-pressure indicator cards is available yet.

Figure 2 shows the theoretical effect of Boyle's law deviation at various temperatures and pressures up to 2,800 pounds per square inch, when working with pure methane. The deviation of all the other gases of the paraffin series is greater than that of methane, hence the data of Figure 2 may be taken to conservatively represent the horsepower advantage due to deviation with any usual gas. In Figure 2 the deviation is presented as a "super-expansibility factor," which is the inverse of the super-compressibility factor. The chart may be used to estimate the effect of deviation in the following manner:

Assume the compressor is to pump gas from 1,200 pounds absolute with 80° F. suction temperature to 2,400 pounds absolute discharge pressure. Use of one of the common methods for estimating the compression temperature rise indicates a discharge temperature of about 180° F. under these conditions. From the chart, the "Y" factor is 1.138 for 1,200 pounds and 80°, and 1.062 for 2,400 pounds and 180°. The deviation effect during the compression stroke will be close to the average of these figures, or 1.100. This means that a compressor horsepower will pump 1.100 times as much gas through this range of pressure as it would through a low-pressure range of the same ratio, where the deviation effect is negligible. This method is only an approximation, but it appears to give results which agree reasonably well with experience to date. It should perhaps be pointed out that the effect of deviation just discussed is in the nature of a correction to be applied to the usual methods for figuring compressor horsepower within pressure ranges wherein deviation is not appreciable; such methods are available in handbooks and in data published by the various compressor manufacturers.

TABLE 1—COST OF COMPRESSION FOR A 2,400-HP. PLANT

Compressing 10,000,000 Feet Per 24 Hours From 30 lb./sq. in. to 1,500 lb./sq. in.

	Cost per 24 hp. hour
Operating labor (3 men at $8.75 and 3 at $7.25 per day	$.0200
Lubricating oil at 40c per gallon	.0040
Water and water treatment	.0005
Lights	.0007
Fuel at 5c per 1,000 cu. ft.	.0120
Repair and maintenance labor	.0070
Repair and maintenance materials	.0035
Miscellaneous supplies	.0004
Auxiliary pump power	.0010
Total cost per 24 hp. hr. including fuel at 5c per 1,000 cu. ft.	$.0491
Total cost per 24 hp. hr. excluding fuel	$.0371

High-Pressure Compressor Installation and Operating Costs

Compressor plant installation costs will, of course, vary over a considerable range according to the size of the installation, operating pressures, and types of auxiliary equipment used as determined by the expected life of the plant. Recent figures on several gas-injection projects involving final discharge pressures ranging from 1,200 pounds to 4,700 pounds indicate that installed costs per horsepower will run from 10 to 20 per cent higher than in plants where the maximum pressure is not over 500 or 600 pounds. For example, a recent 1,500-hp. plant designed to pump gas from 30 pounds to 250 pounds showed an installed cost of about $90 per horsepower; another 2,400-hp. plant to pump from 1,200 pounds to 3,000 pounds cost practically $109 per horsepower. Both of these installations include an "indirect" or closed cooling system, employ angle-type compressor units, and are otherwise quite similar in general standards of construction. The increased cost of the high-pressure installation is caused chiefly by the greater cost of the high-pressure piping and valves, and of the forged-steel compressor cylinder construction.

Operating costs per installed horsepower should run little, if any, higher for a high-pressure plant than for a low. Experience with extreme high pressures is still too limited to yield any good figures on this point. A recent careful analysis of operating cost, based on extensive experience with low-pressure plants combined with what data is now available on high-pressure operation, yields the data shown in Table 1. The plant contains 2,400 hp. of machine capacity, and compresses 10,000,000 cubic feet per 24 hours from 30-pound gauge intake to 1,500-pound final discharge. Similar figures for a variety of plant sizes and pressures are presented in Table 2. The first two sets of figures in Table 2 show the effect of plant size on operating costs per m.c.f. compressed through the same ratios; the other figures show the effect of various compression ratios.

Piping Standards and Safety Provisions

It is self-evident that every possible care should be taken in the design of piping systems, and the actual execution of the work, to guard against mechanical failure when dealing with gas at any pressure. This is particularly true when working with gas injection pressures, since in addition to the hazards from fire which surround any gas operation, terrific mechanical destruction may be produced by the gas itself. It is an interesting fact that so far the accident record of extreme high-pressure gas installations is clean, which simply indicates that with proper design and execution of the work, combined with careful operation, such installations need not present any unusual hazard. The following remarks cover miscellaneous points of design based on my own experience with high pressures.

For the general design and selection of pipe, flanges, and fittings, the present American Standards Association piping code has proven perfectly satisfactory. I believe this code is perhaps overconservative in requirements for pipe thickness, but this is a good fault.

We have found the grooved flanges with soft iron ring gaskets very satisfactory for pressures up to 4,700 pounds, which is the limit of our experience. Incidentally, the static test pressure on the piping system on this job after it was completed was 7,200 pounds. In designing piping where these flanges are used, it should be kept in mind that a joint cannot be broken unless there is an end-play between flanges of about one-half to three-quarters inch, depending on size, to permit dropping out the gasket ring.

Lubricated plug cocks have proven most satisfactory as valves for high pressures; we ordinarily use the worm or spur-gear operated types for sizes above 4 inches.

Check valves should be installed in each compressor discharge branch, and in the main discharge line outside the plant area if practicable.

Expansion and contraction strains in the piping due to operating temperature changes should be carefully studied, and provisions made to take care of them without throwing undue strains on connections to the compressors. This applies particularly to the discharge piping, since the gas is ordinarily not cooled after compression. Strain relief requires rigid anchorages at certain points to prevent creeping, sliding anchorages at other points to permit expansion but prevent vibration, and bends or expansion loops spaced as required to prevent accumulated strains. Expansion of headers between machine centers can be cared for by making the branches long, or by forming vertical loops in them.

We favor the installation of all piping aboveground, including field lines as far as possible. This is ordinarily done by supporting the pipe on substantial concrete piers, with heavy sliding or tight clamps to hold it down. Such construction

TABLE 2—COMPRESSOR PLANT OPERATING COSTS

Plant capacity b.h.p.	Plant capacity m.f.c./day	Number compression stages	Intake pressure lb./sq. in.	Discharge pressure lbs./sq. in.	Compressoin ratio R	Cost of compression Fuel @ 0c per m.c.f.	Cost of compression Fuel @ 5c per m.c.f.
1,200	10,000	2	400	3,000	7.26	0.400	0.544
1,500	10,500	1	400	3,000	7.26	0.475	0.647
1,200	9,000	2	400	4,000	9.68	0.445	0.605
1,200	11,400	1	460	2,500	5.29	0.362	0.492
2,400	10,500	2	30	1,500	33.70	0.765	1.041
1,200	9,000	2	150	1,500	9.18	0.440	0.600

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is little, if any, more expensive than burying, and it eliminates the possibility of failure through external corrosion.

For connecting branch lines into a header, we have found miter welds covered with a standard reinforcing saddle, which is welded to header and branch, more satisfactory than the welding tee fittings.

When installing vent connections from safety valves, bursting discs, or other high-pressure sources, the possible reaction forces at the vent opening must be provided for. A 3-inch vent, blowing 3,000 pounds gas wide open, may exert a reaction force of over 21,000 pounds; obviously such a vent must be properly supported to withstand this force. If screwed vent valves of any kind are used, the vent piping on the discharge side of the valve must be arranged so that the reaction cannot possibly unscrew the valve from its mounting.

We have used electric arc welding with coated rod for all pipe welding as far as possible. The welds are laid in beads not over one-eighth inch thick, with thorough peening between beads. With such procedure it is usual to have the entire piping system pass the final hydrostatic test without a single weld leak.

On account of the extreme destruction which can result from failure of any part of the high-pressure plant piping system, special emergency shut-off arrangements should be provided. In one plant now under construction such a system is arranged so that all sources of gas can be cut off by operating any one of four small plug-cocks, which are placed at strategic points around the plant. Piston-operated plug-cocks are installed outside the plant fence in both incoming and outgoing main lines. Opening any one of the four emergency control valves will simultaneously close both these main cocks, blow down the pressure on the piping within the plant through a 3-inch diaphragm valve, and shut down the engines. The emergency controls are located in the compressor house, the office, at the plant gate, and at a point some distance outside of the fence.

Hydrate Formation at High Pressures

It has long been known that natural gas components form loose chemical compounds or "hydrates" with water, which hydrates freeze into ice-like solids at temperatures above the freezing point of water; and that the freezing point of the hydrates rises with increasing pressure. The behavior of a typical gas in this respect has been given by Hammerschmidt in Industrial & Engineering Chemistry, Vol. 26, 1934, page 851. Hammerschmidt's curve and formula have been checked many times by experience, and may be taken to apply with reasonable accuracy to any usual composition of natural gas. Within my own experience I have seen hydrates form and partially plug pipe lines under the following approximate conditions: 42° F. at 250 pounds gauge, 54° F. at 420 pounds gauge, and 80° F. at 4,000 pounds gauge. Thus there is real danger of hydrate formation at normal temperatures in lines handling gas for gas injection.

Hydrates form only if the gas is at least saturated with water vapor under the conditions of temperature and pressure prevailing, hence their formation can be prevented by dehydrating the gas. Under most circumstances this would be impractical, and the only feasible way of preventing their formation is to keep the pipe line temperature above the temperature of hydrate formation. Under California conditions the heat of compression will ordinarily take care of this. At the Tepetate plant it was necessary to insulate part of the return line in order to conserve the heat of compression. In extreme cases it might be necessary to apply heat to parts of the line remote from the plant. This could best be done with a hot water or steam jacket on the line, in order to avoid danger of overheating the pipe.

In considering a new plant, the tendency of

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the gas to become leaner and to increase in volume should be kept in mind. Since a long life can be expected, the operator would be justified in selecting a plant somewhat over-designed for immediate requirements, so as to have some reserve for gas-handling and oil-circulating capacity. In any event, the plant should be so planned as to permit future expansion of these facilities at a minimum expense.

The question of what is the best plant operating pressure can be settled only through a careful study of all the conditions surrounding the production and marketing of both the oil and the gas. The most vital point is the relative value of the natural gasoline if left in the crude oil as compared with its value as a separate product. If this material has more value in the crude, higher final trap and gasoline plant operating pressures are indicated, and vice versa. Subject to this limitation, the higher the plant pressure the more economical the whole operation is likely to be, since raising the plant pressure obviously reduces the compressor horsepower required for returning the gas.

It is my opinion that gasoline plants operating in conjunction with gas injection will tend toward higher pressures than have been used, combined with stabilization of the crude to give it marketable specifications. In view of some recent work, I believe it is entirely practical to operate an absorption plant at pressures of at least 1,200 pounds per square inch.

Conclusions

Gas pressure maintenance or repressuring operations tend to improve the operating conditions of natural gasoline plants associated with them in the following ways:

(*a*) By greatly increasing the average operating life.

(*b*) By stabilizing the rate of natural gasoline production.

(*c*) By preventing waste of dry gas which may be eventually sold.

In view of the result already accomplished, it is felt that this general subject deserves the earnest attention and support of everyone interested in natural gasoline production.

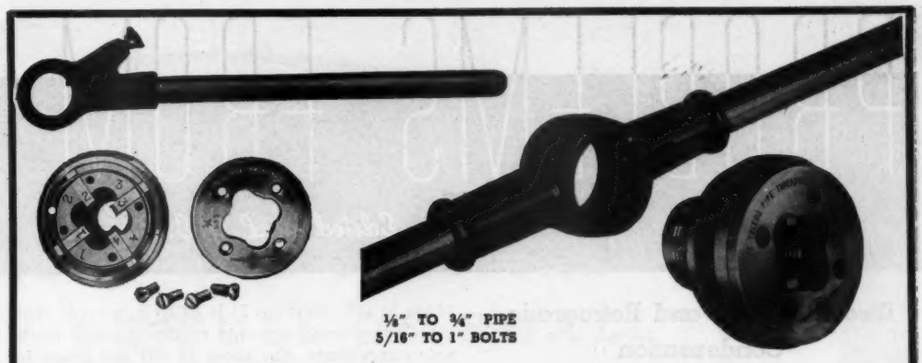
In closing, I want to express my thanks to A. K. Hegeman of Clark Bros. Co. and Jim Reed of Cooper-Bessemer for information on costs and super-compressibility, and to C. R. Williams of the Continental Oil Co., George Sowards of the Ohio Oil Co., and T. A. Huber of Humble Oil & Refining Co. for data on actual operating results.

Temperature Symposium

A symposium on "Temperature and Its Measurement in Science and Industry" will be held under the auspices of the American Institute of Physics, probably next fall, the dates to be announced later. Consistent with the title, the symposium will broadly cover many fields.

A representative steering committee has been formed consisting of the chairman, C. O. Fairchild, director of research, C. J. Tagliabue Manufacturing Co.; Dr. E. F. DuBois, medical director, Russell Sage Institute of Pathology and professor of medicine Cornell University Medical College; Dr. Gustav Egloff, director of research, Universal Oil Products Co.; Dr. John Johnston, director of research, U. S. Steel Corp.; Dr. Walter G. Whitman, head, department of chemical engineering, Massachusetts Institute of Technology; and Dr. H. A. Barton, director, American Institute of Physics.

Those who are interested in taking part in this symposium should communicate with the institute at an early date, giving information regarding their field of work and the subject of the contribution they wish to make. Such contributions will be coordinated with the subjects of a group of invited papers, and assignments and divisions made. Further information for contributors will be available shortly.



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PROBLEMS FROM READERS

Edited by L. G. E. Bignell

Distillate Pools and Retrograde Condensation

I am interested in learning more about the so-called distillate wells and "retrograde condensation" which I have seen mentioned in recent literature. Can you give me any references to articles on this subject?—G. N. D.

There has not been a great deal written on those subjects but they have been studied by technical men who have been confronted with the problems of producing from formations in which the hydrocarbons existed under conditions of pressure and temperature which retained the contents of the reservoir in a vapor rather than a liquid phase. W. N. Lacey and his associates have made an extended study of these conditions under A.P.I. Project No. 37 which has been reported in A.P.I. bulletins and also in Industrial and Engineering Chemistry. Others have done considerable work upon the behavior of hydrocarbons under high pressures and temperatures and these findings form the basis for the petroleum engineers study of conditions in unusual fields where the production is in the form of a gas.

Before the San Antonio meeting of the A.I.M.E., E. V. Foran, of the consulting engineering firm of Parker, Knode, Foran and Boatright of Austin, Tex., presented a very interesting paper on "Development and Production Problems of High-Presure Distillate Pools." The following discourse is taken from Mr. Foran's paper.

"Among the many newer disclosures that have accompanied the petroleum industry's progressively deeper exploratory drilling is the increased frequency with which the operators are encountering reservoirs of which the products at the time of discovery exist wholly or predominantly in the gas phase. The popular term "distillate pool" is most often used within the industry when referring to this type of reservoir, and in this paper the term is used in that sense. These pools have been observed in many different surroundings. In some places the entire reservoir is filled with the wet gas containing its water-white condensible products in the gas phase but apparently with no dark oil or other hydrocarbon liquids in the reservoir. The 8,200-foot horizon in the Big Lake field in West Texas is a good example of this type. At other places the wet, or distillate-bearing, gas may form a large gas cap directly overlying and in contact with an extensive reserve of dark oil. Oklahoma City, Kettleman Hills, the 8,500-foot horizon in the Big Lake field, and many others are examples of this type. There are also many places in which the wet distillate-bearing gas fills nearly the entire reservoir space, while the dark oil occupies only a narrow, bandlike zone, which marks the boundary of the reservoir along its lowest productive contour.

"The heavier components of these deep-pool gases are generally water white in color, a large portion of which are condensible in a conventional oil and gas separator, when operated under pressures of the order of 400 to 800 pounds per square inch. Although the water-white products recovered in the separator sometimes have endpoints of 650° F. and higher on standard Engler distillation, they occur only in the gas phase in the reservoir. It is entirely possible that even some small amounts of dark-colored reservoir components may occur in the gas phase in the reservoir. It is entirely possible that even some small amounts of dark-colored reservoir components may occur in the gas phase when the temperature is 300° F. and presures exceed 6,000 pounds per square inch. Close approaches to these conditions have been encountered in the deepest producing wells. The condensible content of the deep reservoir gases of the many pools that have been tested or produced to date shows a wide variation in both condensible content, per 1,000 cu. ft. of gas, and physical character. Apparently, also, little consistent relationship exists between reservoir temperatures and pressures of the different pools. The variation in the condensible content of the reservoir gases of several pools examined by the writer indicates a spread of from 0.45 gallon per 1,000 cu. ft. of gas to as high as 4.4 gallons per 1,000 cu. ft. of gas. The depths at which these distillate-bearing gas reservoirs were encountered varied from 4,000 to 9,000 feet, and temperatures varied from 145° to 235° F.

"Although the reservoir contents of the distillate type of pool may all be in the gas phase at the time of discovery, they do not long remain so if, during development, an appreciable decline in reservoir pressure takes place. Some of the heavier hydrocarbon vapors, a large portion of which lie within the range of motor-fuel fractions, will condense or precipitate in the reservoir as the pressure is lowered, even though no change in temperature takes place. In this respect the deep high-pressure reservoirs of wet gas react to pressure decline in a manner exactly opposite to that of the shallower wet-gas reservoirs whose contents are composed of more volatile contents than the deep pools. This phenomenon is known as "retrograde condensation" and has been a subject of considerable research. The fundamental principles governing retrograde condensation of hydrocarbons are covered in a report by Dr. W. N. Lacey and associates.

"It follows, then, that any mode of development or operation that results in a decline in the reservoir pressure will have proportionate effect on the ultimate recoveries of the condensible contents of the reservoir. The rate at which the pressure decline takes place will have no bearing on the extent of condensation within the reservoir, a slow progressive drop having the same effect as a rapid drop if the ultimate pressure change is the same in each case. While it is true that slight temperature changes within the reservoir may take place during the course of pressure decline within the reservoir, they are of no importance in their effect on condensation except possibly in the immediate vicinity of the well bore.

"The manner in which the condensation takes place in the reservoir is a matter of interpretation, but it seems reasonable to believe that it occurs throughout the porous section of the reservoirs. It results in the wetting of the sand or lime surfaces surrounding the pores of the formation, but the quantity is too small to produce enough liquid to gravitate downward into the lower sections of the sands and concentrate there as a free liquid, except in the immediate area of the well bore, where, of course, this is entirely possible. The fact that the potential liquid condensate in a sand 25 per cent porosity varies from approximately 20 bbls. per acre-foot to not over 150 bbls. per foot will serve to explain why any condensation that takes place in the reservoir other than that at the immediate well bore will not be recoverable except by methods of induced secondary saturation by means of recycling residue gas.

"It may also be concluded from observations that the first products to condense in the reservoir will be composed of the heaviest components of the gas; gradually the condensate becomes higher in gravity as the pressures progressively decline. However, even the initial and heaviest condensates that form as a result of the early pressure drop in the reservoir will carry with them small amounts of the lighter fractions. This aspect of condensation in the reservoir may be partly illustrated by observing the character of retrograde condensation in high-pressure separators. This is readily accomplished by passing a well-head flow stream of constant composition through the separator and observing the results while the separator pressures are varied through a range of from 1,000 to 2,500 pounds per square inch with constant temperature at the point of separation.

"When it is borne in mind that the various distillate reservoirs having an average porosity of 25 per cent and a pressure of 2,500 pounds per square inch contain an initial reserve of from only 20 to 150 bbls. of condensable products per acre-foot, it can be readily seen that development must be restricted proportionately. The relative values of the residue gas and recoverable condensable products in the reservoir will vary greatly as among pools. Assuming the value of residue gas to be 4 cents per 1,000 cu. ft. it would indicate that in practically all cases where the condensable content of the gas exceeds 1.5 gallons per 1,000 cu. ft., or 36 bbls. per million cubic feet of gas, the value of the condensable products in place or on the surface exceeds that of the residue gas. If, in the absence of a market for the residue gas it becomes desirable to develop and operate the property, it will be necessary to return the residue gas to the same reservoir from which it came. The gas must be recycled for the sole purpose of increasing the ultimate recovery of condensable gases from the reservoir; the recycling will, of course, in no way affect the ultimate recovery of the residue or fixed gases from the reservoir.

"From the well-established fact that precipitation or condensation within the reservoir takes place as a result of pressure drop alone and in such insufficient quantities that concentration in the sands as a recoverable liquid is negligible, it is obvious that a development program of close well spacing will not increase the ultimate recovery of the condensable products of the reservoir. This fact holds true even for pools having the highest condensable content yet discovered. This same fact indicates definitely that all gases subject to retrograde condensation within the reservoir must be recovered from the reservoir in the vapor phase only."

EVEN THOUGH YOUR DRILLED HOLE MEASURES STRAIGHT AND VERTICAL, IT MAY BE FULL OF SMALL OFFSETS AND JAGGED EDGES— CAUSING EXCESSIVE WEAR ON YOUR TOOL JOINTS AND INCREASING DRILLING COSTS

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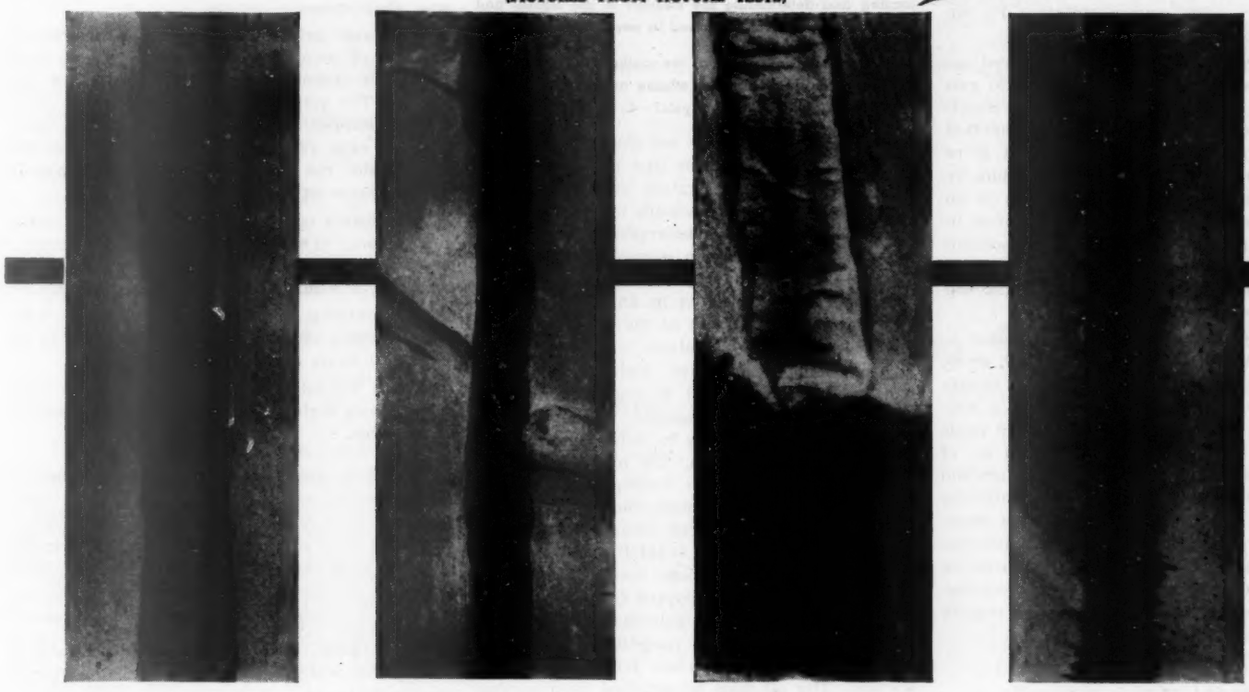

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QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Analytical Method for Mercaptan Sulfur in Petroleum Oils

Is there any reliable laboratory method suitable for finding the percentage of sulfur in the form of mercaptans in gasoline and kerosene?—D. G. B.

The method here described is arranged to give final results in terms of milligrams of mercaptan sulfur per 100 cc. of oil, so may be converted to per cent by proper placing of a decimal point.

Apparatus and reagents: A 150 cc. separatory funnel; 50 cc. burette; funnel cotton. Sweet solvent naphtha; N/10 sodium thiosulfate solution; acetic acid; starch solution; 25 per cent potassium iodide solution, 10 per cent sodium hydroxide solution; nitric acid; copper sulfate C.P., ammonium hydroxide.

The standard copper solution is prepared and standardized as follows: Dissolve about 20 gms. copper sulfate crystals in 100 cc. water. Slowly add 50 cc. sodium hydroxide to the cold solution. If the gelatinous mass becomes dark, it is rejected and another prepared. Add ammonium hydroxide until a clear dark blue solution is obtained. Any precipitate should be removed by filtering through cotton. The clear solution serves as a stock from which a portion is diluted for standardization so as to contain 1 mgm. copper per cubic centimeter.

Evaporate 100 cc. of the copper solution to about 2 to 5 cc. without spattering. Cool, dilute to 100 cc. with cold distilled water and acidify with dilute nitric acid. Neutralize with a solution of sodium hydroxide which has been made slightly acidic with acetic acid. Add 10 cc. of potassium iodide solution to the cold solution and titrate with N/10 sodium thiosulfate until the yellow color is nearly discharged, add few drops starch solution, then continue titration until blue color is discharged. The blue color returns on standing but the first endpoint is the correct one. The 100 cc. of copper solution should require 15.7 cc. N/10 thiosulfate.

The reactions are:

$$2CuSO_4 + 4KI = CuI + 2K_2SO_4 + I_2$$

$$2Na_2S_2O_3 + I_2 = Na_2S_4O_6 + 2NaI$$

The copper mercaptides $(RS)_2Cu$, are formed. One mole of copper is therefore equivalent to two of sulfur, or 63.57 copper and 64.12 sulfur. These are so nearly the same that it is assumed that 1 mgm. copper is equivalent to 1 mgm. mercaptan sulfur.

By standardization: 1 cc. N/10 $Na_2S_2O_3$ = 1 cc. N/10 Cu or 0.0064 gram copper, or 15.7 cc. N/10 $Ha_2S_2O_3$ = 100 cc. copper solution. Therefore 1 cc. copper solution = 1 mgm. mercaptan sulfur method.

1. 25-50 cc. of the oil to be tested shall be accurately measured into a separatory funnel and 50 cc. of "sweet" solvent naphtha added.

2. One cc. of the standardized copper solution shall be added from a burette and the mixture shaken until the color is discharged.

3. The spent copper solution shall be drawn off and the operation repeated until the blue color is no longer discharged.

Note.—Sometimes a bluish opalescent color is observed which should not be confused with the blue of the copper solution. If the separatory funnel is held against a piece of white paper the blue of the copper is easily distinguished.

4. Each cc. of copper solution used indicates 1 mgm. of mercaptan sulfur which shall be calculated for 100 cc. of oil and the results reported as milligrams of mercaptan sulfur per 100 cc. of sample.

Reference: Method of the Standard Oil Co. of New Jersey.

Separation and Identification of Soil Hydrocarbons

Will you kindly suggest a chemical method for releasing and determining the amount of the lighter and heavier hydrocarbons absorbed in porous soils—J. A. H.

Can you tell me some of the methods used to measure very small amounts of ethane and methane, such as is done in soil gas analysis?—C. H. T.

Slight warming of the soil should release any of the lower hydrocarbons that may be present. Heating to a high temperature, above the boiling point of water, is not advisable because some organic matter may be decomposed causing the formation of hydrocarbon gases and thus be responsible for misleading data. The gas released from the soil is collected in any device which will permit measurement of the volume and removal of portions for analysis.

The common substances, such as water, carbon dioxide oxygen and hydrogen sulfide are first removed from the sample. Then the quantity of hydrocarbons may be determined by low temperature fractionation. The hydrocarbons are easily identified by their boiling points, which are far enough apart to make identification quite easy. The boiling point of ethane is —88.3° C. (—128° F.) and methane —161.4° C. (—258° F.).

The heavier hydrocarbons, such as are present in crude oil, may be separated from the soil by extracting with suitable solvents. The solvents commonly used for this purpose include ether, chloroform, benzene, carbon tetrachloride, and acetone. The oil may be obtained as a residue after evaporation of the extract.

CHEMICALS FOR THE PETROLEUM INDUSTRY

Isooctane

(2,2,4-trimethylpentane)

Use—Primary standard for knock rating of motor fuels.

Form—Colorless liquid.

Formula—$CH_3 \cdot CH_2 \cdot C \cdot CH_2 \cdot CH_2 \cdot CHCH_3CH_3$

Specific gravity—0.6918 (73° A.P.I.).

Boiling point—210° F.

Melting point— —161° F.

LIMITATIONS

Knock rating	99.9 to 100.1
Freezing point, min.	—161.5° F.
Boiling point, max.	210.2° F.
Density at 68° F. gm/ml	0.6918 to 0.692

Observations on the Toxicity of Pure Iron Carbonyl to Rabbits

We have read your explanation of the nature of iron carbonyl, an antiknock substance, in The Oil and Gas Journal, December 8, 1938, Page 57. It is not clear whether or not this material has any poisonous action and if you can explain this it will be valued.—R. C.

The literature available does not reveal anything showing the toxic nature of gasoline containing iron carbonyl. There is some evidence that exposure to the pure compound, and highly concentrated solutions, may result in acute poisoning. R. A. Kehoe, University of Cincinnati, reports some observations in which iron carbonyl was administered to rabbits.

Pure iron carbonyl was applied to the abdominal skin of several rabbits and their heads held in an air-stream to prevent inhalation of the vapors. The volatility of the compound is such that it disappears in from 5 to 15 minutes, leaving the skin red and dry. The characteristic smoky odor can de detected after the apparent disappearance of the liquid.

Application of 2 cc. in one dose caused death in 36 hours; 10 cc. resulted in death in 48 hours; and 20 cc. in two doses of 10 cc. each, with an interval of 30 minutes, caused death in 12 hours.

Subcutaneous injections of three rabbits with 0.5 cc., 1 cc., and 2 cc., respectively, died in 60 hours, 40 hours and 16 hours.

When the animals were exposed in air containing iron carbonyl the results were as shown in the table.

RABBITS IN AIR CONTAINING IRON CARBONYL

Exposure hours	Quantity, mg./liter	Death in hours
2	20	12
1	10	17
1	7.5	12
1	2.5	41
1	1.0	40

When pure iron carbonyl was administered to a rabbit orally in a dose of 1 cc., the animal died in 18 hours.

The action was essentially the same regardless of mode of application, although the animal killed by oral administration showed gastro-intestinal irritation in addition to the characteristic lesions elsewhere. These characteristics included a striking degree of edema and acute congestion of the lungs, with occasional petechial hemorrhages, acute dilation of the heart, and acute toxic changes of the liver and kidneys. The alimentary tract, except when the carbonyl was introduced by the mouth, was almost normal.

No evidence was obtained indicating a release of carbon monoxide into the blood. Animals treated with toxic quantities of the material always showed the same striking symptoms. Rapid and labored respiration developed and the animal sat with the head sharply retracted and nose pointing upward.

Questions on Petroleum Technology may be sent to Dr. Charles K. Francis, The Oil and Gas Journal, Tulsa, Okla. When a copy of the answer is desired, postage should be included.

FIELD OPERATIONS

Summarizing the Week's Developments

KANSAS—Wildcat pool openers were completed in Section 13-11-18w, Ellis County, and Section 14-19-15w, Barton County. The Walters pool, Ellis County, was extended one-fourth mile eastward. Largest completion of the week was a 3,546-bbl. well in the Hittle pool, Cowley County. The Leesburgh pool in Stafford County and Allon pool in Russell County were extended, and a deep pay zone was uncovered in the Fairfield pool, Russell County.

OKLAHOMA—Deep wildcat tests were started in Section 12-14-3w, north of Edmond in Oklahoma County, and Section 25-2n-2e, in northern Murray County and east of Wynnewood. The twenty-first well was near completion in the Ramsey pool, Payne County, and five other Ramsey tests were at various stages ranging from location to drilling.

NEW MEXICO—Wildcat exploration in southeastern New Mexico increased, with two outposts started in the vicinity of Roswell, Chaves County; another in Section 27-10-30, eastern Chaves County, and a fourth one in Section 30-16-32, western Lea County. Work was resumed at a wildcat in Section 33-16-36, 3 miles west of production in the Lovington pool, Lea County.

WYOMING—Lance Creek supplied a 2,500- and a 2,240-bbl. well, producing from the Leo sand.

TEXAS—A new pool in Refugio County and a number of field extensions are reported from Southwest Texas. Wilcox sand (Tertiary), is opened in the Segno pool in Polk County on the Gulf Coast. Three 4,300-foot tests are projected for the north extension area of the Hull-Silk pool in Wichita County, and an extensive wildcatting campaign is mapped out for the county. A 3,137-bbl. potential was made by J. E. Mabee No. 4 Willard which extended the Bennett pool a quarter mile. His No. 3 Willard made 3,116 bbls. in a day. An 1,810-bbl. production was made by a Griffin pool well in Jones County.

LA-ARK-TEX—In South Louisiana the first oil production in St. Bernard Parish is in prospect in a test on the east side of the Mississippi River, 25 miles southeast of New Orleans. A new spot in Cameron Parish is showing signs of oil production.

ILLINOIS—Fifty-three wells were completed and 45 new operations started in Illinois, where in some parts of the field in these flood days it is necessary to go from well to well in boats. Production in the basin fields averaged 141,894 bbls. per day during the week.

MICHIGAN—New pools are indicated in Van Buren and Allegan counties. Van Buren field production has risen to 13,211 bbls. per day making it the largest producer in the state. Buckley is down to 9,704 bbls. and Freeman-Redding is up to 9,986 bbls. A 4,000-bbl. well, acidized, was completed in Clare County.

CALIFORNIA—A new pool is in prospect south of the most southeasterly tip of the Mountain View field in Kern County. The discovery well flowed 500 bbls. in one hour through a tester. The depth is 6,274 feet.

Completions in All Fields

(Week Ending February 18, 1939)

	Oil	Gas	Dry	Total	1939 total comp. to date	1938 total comp. to date
N. Y., Pa., and W. Va.	55	9	3	67	465	770
Ohio	2	9	5	16	138	144
Indiana	0	0	0	0	21	15
Kentucky	1	0	1	2	80	104
Illinois	42	1	10	53	500	79
Michigan	15	0	8	23	147	102
Kansas	18	2	6	26	160	286
Oklahoma	16	0	14	30	234	260
Texas:						
North Central Texas	21	0	17	38	282	357
West Texas	39	0	6	45	265	357
Texas Panhandle	6	0	1	7	55	119
East Texas	12	0	0	12	133	369
East Central Texas	2	1	2	5	35	58
East Texas Border	3	0	2	5	17	21
Gulf Coast Texas	21	1	5	27	185	179
Southwest Texas	32	2	18	52	321	291
Total Texas	136	4	51	191	1,293	1,751
North Louisiana	3	0	1	4	60	86
Gulf Coast Louisiana	10	0	4	14	102	81
Total Louisiana	13	0	5	18	162	167
Arkansas	0	0	0	0	35	32
Montana	2	0	0	2	19	7
Wyoming	2	0	0	2	11	22
Colorado	0	0	0	0	1	1
New Mexico	10	0	0	10	92	85
Utah	0	0	0	0	0	0
California	17	0	8	25	132	218
Total United States	329	25	111	465	3,490	4,043
Total previous week	331	28	125	484		
Week ending Feb. 19, 1938	372	31	92	495		

Outstanding Fields—Highlights

(Week Ending February 18, 1939)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
K.M.A.	35	46	7	5,544	930	21,100
Wasson-Bennett	9	33	6	10,098	218	10,246
Ector County	8	67	14	14,990	1,577	43,647
Winkler County	0	12	6	3,009	1,764	36,549
Howard-Glasscock	3	23	0	0	1,042	15,700
East Texas	7	28	12	627	25,982	372,397
OKLAHOMA						
St. Louis	6	27	3	850	777	26,500
Sac and Fox	4	10	2	237	88	2,690
KANSAS						
Barton County	3	13	2	355	404	11,105
Stafford County	5	15	3	786	246	5,235
Rice County	3	15	2	1,551	1,271	28,855
Russell County	4	19	4	2,104	1,197	22,370
NEW MEXICO						
Lea County	7	58	9	1,358	2,033	94,850
LA-ARK-TEX						
Rodessa, La-Ark-Tex	2	6	1	805	1,066	63,990
Cotton Valley, La. (deep)	1	9	0	0	114	10,460
Schuler, Ark.	1	3	0	0	167	18,805
Jennings, La.	1	6	0	0	138	27,837
MICHIGAN						
Freeman-Redding	6	18	4	7,500	61	9,986
ILLINOIS						
Central Illinois	40	360	42	6,690	2,463	141,894
CALIFORNIA						
Wilmington	4	15	4	931	597	86,750
KENTUCKY						
Birk City	4	13	0	0	119	2,673

Illinois and Kentucky

By STAFF CORRESPONDENT

Forty-two Oil Wells, One Gas Well and 9 Dry Holes Added

MATTOON, Ill., Feb. 20.—Only 53 wells were completed in Illinois in the past week in review and only 45 new operations started. Four of the new operations were wildcats. Ten wildcats were dry and abandoned.

Forty-two oil wells and one gas well were completed, the oil wells tanking 6,690 bbls. of initial production, with numerous wells in the Louden and Salem fields producing only a short time on their initial producing day. Three hours sufficed to recover the allowable production, or more, in most of these short-time tests, and the producers contented themselves with leaving the remainder of the daily potential in the best oil storehouse of all—the pay horizon.

In the Louden field 14 oil wells and one dry hole were completed, the initial production totaling 2,458 bbls. Two wells in Richland County registered 400 bbls. production. A good sized gasser was completed in Lawrence County. Three oil wells with an initial of 1,308 bbls. were completed in Clay County, along with one dry hole. In Marion County, 23 oil wells with an initial production of 2,524 bbls. and three dry holes were finished. Twenty-two of the oil wells were in the Salem pool and one, a 48-bbl. well, in the Centralia field. One dry hole each was reported from Brown, Randolph, Jefferson, Washington and Wabash counties.

R. E. Wheless and his associates are doing their best to make a well out of No. 1 Michaels, SW SW NW Section 1-11n-7e, in Coles County. This well has been in for some time but is not yet a completion. It had Bethel sand at 1,992-2,013 feet and was drilled to 2,173 feet. The Bethel sand was not commercially productive and the hole was plugged back to 1,919 feet and shot with 80 quarts in Cypress sand at 1,879-1,905 feet. Casing had been set at 1,876 feet, which may account for the fact that there was water with the oil showing. Wheless has been working over the well and the last record of its production test credits it with having pumped 27 bbls. of fluid, 50 per cent oil, in 12 hours.

It is evident that the owners have not lost faith in the area as a new well has been started by them, offsetting No. 1 Michaels on the west in SE SE NE Section 2-11n-7e which was drilling below 400 feet when the well was last visited. As Mattoon is in Coles County, much interest has been taken in this well by local citizens generally as they are anxious that the city become an oil center as well as a headquarters town for oil companies and individuals operating in the state.

Williams Brothers Corp. is building a booster station south of Lawrenceville for the Central States Pipe Line Co. (Texas Co.) which has a pipe line from the Salem field in Marion County to the Indian Refining Co. (Texas Co.) plant at Lawrenceville.

High water and mud continue to hold back development work in fields and are the cause of the relatively small number of completed wells and new operations.

Completed Wells

Following are the completions reported in the past week, the initial production of the oil wells representing 24 hours unless otherwise stated:

In the Louden field in Fayette County, Carter Oil Co. No. 4 Cunningham, SW NW SW Section 32-8n-3e, Bethel sand at 1,557-86 feet, shot with 60 quarts, flowed 229 bbls. in 12 hours, rated at 456 bbls. per day, and 85,000 cu. ft. of gas. Carter No. 1 Robert Matson, SE NE SE Section 11-8n-3e, Weller at 1,444-68 feet, shot with 40 quarts, pumped 150 bbls. Carter Oil Co. and Reed No. 4 M. Reed, SW SW SE Section 11-8n-3e, Weller at 1,423-59 feet, shot with 80 quarts, flowed 342 bbls. in 14 hours, rated at 513 bbls. per day and 125,000 cu. ft. of gas. Carter Oil Co. No. 2 K. Owens, NE SW SW Section 29-8n-3e, Bethel sand at 1,506-12 feet, shot with 10 quarts, swabbed 133 bbls. in four hours through casing. Carter No. 3 K. Owens, SE NE SW Section 29-8n-3e, Bethel at 1,499-1,509 feet, shot with 15 quarts, swabbed 233 bbls. in 24 hours. E. F. Jones No. 1 Clara McCann, SW NW SE Section 31-8n-3e, Weller at 1,508-22 feet, shot with 20 quarts, dry and abandoned; total depth 1,582 feet. Carter No. 2 Curtis Baker, NE NW NW Section 6-7n-3e, Weller at 1,505-43 feet, shot with 20 quarts, swabbed 143 bbls. Carter Oil No. 5 I. Hobbs, NW NE NE Section 6-7n-3e, Weller at 1,450-78 feet, Bethel sand at 1,548-74 feet, shot with 40 quarts, pumped 172 bbls. of oil and 5 bbls. of water. Carter No. 1 H. Yolton, SE NE NE Section 7-7n-3e, Bethel at 1,497-1,520 feet, shot with 20 quarts, swabbed 351 bbls. Carter No. 1 Mary Hoar, NW NE SE Section 8-7n-3e, Stray sand at 1,503-22 feet, shot with 20 quarts, pumped 93 bbls. Carter No. 1 B. Hoover, NW SE NW Section 9-7n-3e, Stray sand at 1,577-84 feet,

Illinois Fields

HIGHLIGHTS OF THE WEEK: High water, deep mud and a consequent falling off in field work has not affected production in the basin fields, or the state generally. Only 42 oil wells were completed last week. Owners of the only oil well in Coles County have started an offset notwithstanding the discovery well is showing only 25 bbls. a day with a lot of water, indicating their confidence in the structure.

Daily production of new pools, 141,894 bbls.; of old pools, 7,922; total, 149,816 bbls.

Completed oil wells, 42; operations, including locations, rigs and wells drilling, 432.

Report Only One Completion From Water-Covered Fields

OWENSBORO, Ky., Feb. 20.—Practically the whole western Kentucky field is badly affected by high water. Either the operations are shut down or, if active, are not to be reached because of flood and mud. Only one completed well was reported during the past week, and it was a dry hole in the Patesville district in Hancock County, drilled through the McClosky lime. Birk City had no completions and only one new operation. The possibility of a McClosky lime pool looms in the Corydon district, southwest of Henderson in Henderson County, where Sun Oil Co. and Kentucky Natural Gas Co. found McClosky lime at 2,602 feet and cored good saturation and will drill in with cable tools. In the Utica district in Daviess County, a new well not yet shot was producing 1 bbl. of oil per hour from Jones sand and looked like a pool opener.

Following is the scant news developed during the week from areas that were in some way accessible:

Breckinridge County, Cloverport district: F. Douthitt and others No. 1 J. A. Waggoner, location.

Daviess County, Thurston district: J. C. Preston and others No. 1 Charles Abel, rigging up for a McClosky test. Utica district: A. V. Smith and others No. 1 Cravens Heirs, bailing 1 bbl. per hour from Jones sand before the shot, sand at 1,340-51 feet. This well is expected to open up a new Jones sand pool. Birk City: Ky-Mo Oil Co. No. 1 Pittman, cored McClosky lime at 1,879-86 feet, good saturation, total depth 1,904 feet. Jess Ashby and others No. 1 R. M. Hagan, cored McClosky lime at 1,829-40 feet and set casing. Major Oil Co. No. 1 Hobart West, cored McClosky lime at 1,865-1,910 feet, cemented casing. Owen & Borders No. 1 Sylvester Wile, spudded and shut down on account of high water.

Hancock County, Patesville district: Henry & Ross No. 3 E. F. Boling, dry hole through McClosky lime, total depth 948 feet.

Henderson County, Birk City district: Sun Oil Co. and Kentucky Natural Gas Co. No. 2 Ezra Allgood, set casing at 1,894 feet, good core Corydon district: Sun Oil Co. and Kentucky Natural Gas Co. No. 1 George Trigg, cored McClosky saturation at 2,602-05 feet. Will drill in with cable tools.

EASTERN KENTUCKY

ASHLAND, Ky., Feb. 20.—A slight increase is noted in eastern Kentucky field activities this week although reports continue light and there were no completions.

In the South Fork district of Powell County, Boyd, Knox & Brown are down 600 feet in No. 4 I. T. Rogers, at Rogers Chapel. Operator Perry has reached the 700-foot level in No. 1 Virgil Sparks at Pilot. Less Jones was drilling at 300 feet in No. 1 Maggie Oaks at Pilot. Moore & Rogers were drilling at 150 feet in No. 1 Ollie Rogers at Rogers Chapel.

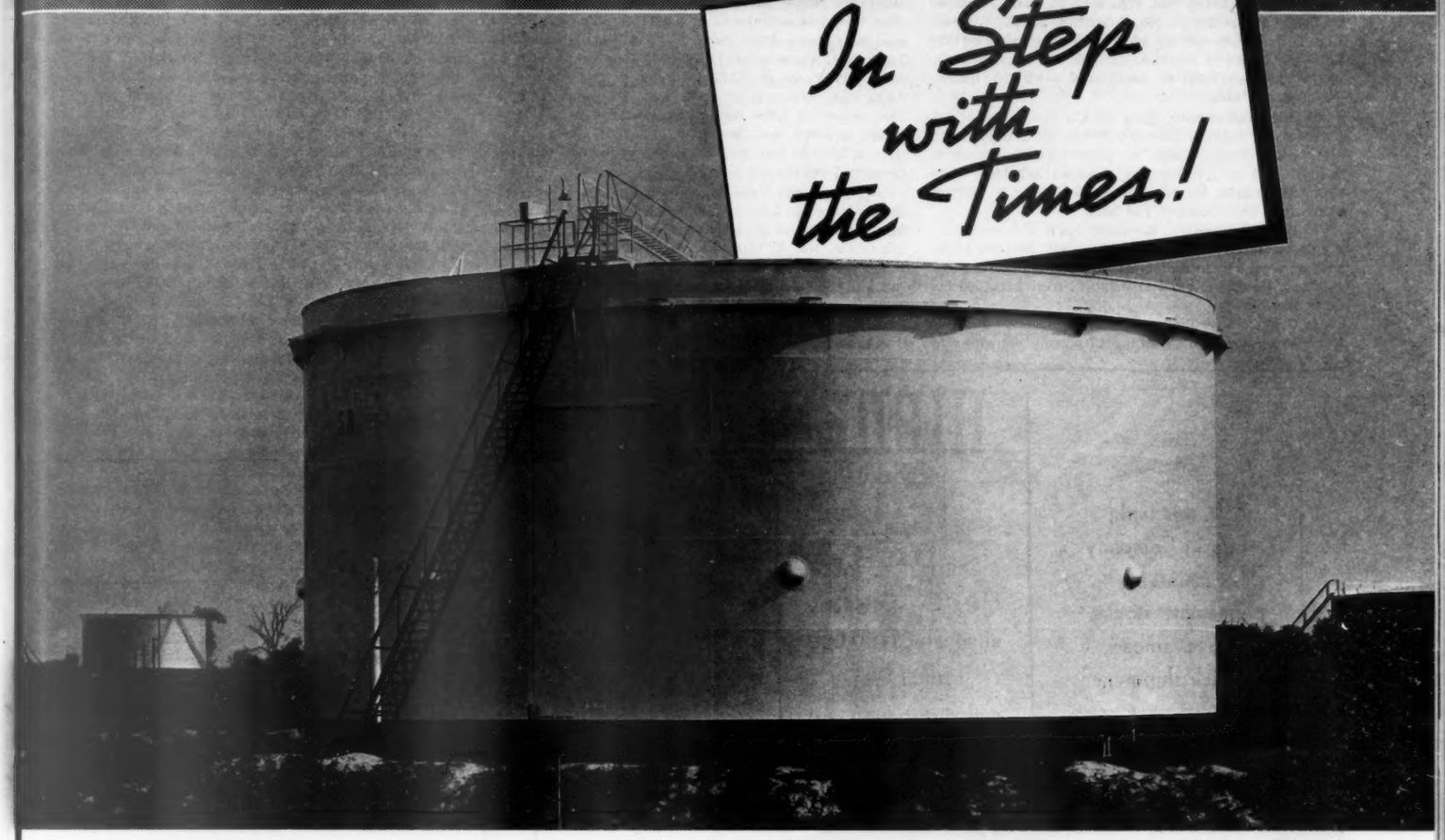
In Knott County, Inland Gas Corp. was rigging up No. 206 on the Zada Hutcherson land on the Right Fork of Troublesome Creek, and rigging up No. 207 on the Curtis Pigman land, also on the Right Fork of Troublesome Creek. Kentucky-West Virginia Gas Co. is building road to No. 579 Sherwood Osborn, on Little Doty Branch and is moving to No. 580, H. H. Smith land on Caney Fork.

In Floyd County, West Virginia Gas Co. is repairing road to No. 5250 William Crider on Johns Creek.

In Martin County, Kentucky-West Virginia Gas Co. is down 44 feet in sand in No. 5251 on the C. W. Preece land on Coldwater Fork.

The Busseyville-Fallsburg district in Lawrence County, the Burton-Oil Springs district in Magoffin County reports "no drilling" and the same report comes from the Wheelersburg district in Magoffin County.

WIGGINS PONTOON ROOFS



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TYPE OF STORAGE	NEW TANKS	TANKS WITH GOOD ROOFS	TANKS REQUIRING NEW ROOFS
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SLOW WORKING	BALLOON ROOF OR HORTONSPHEROID	BALLOON SYSTEM	BALLOON ROOF
FAST WORKING	PONTOON ROOF	BALLOON SYSTEM	PONTOON ROOF
HIGHLY VOLATILE	HORTONSPHEROID		

FOR CRUDE OIL STORAGE

TYPE OF STORAGE	NEW TANKS	TANKS WITH GOOD ROOFS	TANKS REQUIRING NEW ROOFS
FULL STANDING	BREATHER ROOF	BALLOON SYSTEM	BREATHER ROOF
SLOW WORKING	BREATHER ROOF OR BALLOON ROOF	BALLOON SYSTEM	BREATHER ROOF OR BALLOON ROOF
FAST WORKING	PONTOON ROOF	BALLOON SYSTEM	PONTOON ROOF
SOUR OILS	BREATHER ROOF OR PONTOON ROOF	BALLOON SYSTEM	BREATHER ROOF OR PONTOON ROOF

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CLEVELAND.....2204 Rockefeller Building
NEW YORK.....3347-165 Broadway Building
PHILADELPHIA.....1615-1700 Walnut St. Building
BOSTON.....1817 Consolidated Gas Building
SAN FRANCISCO.....1064 Rialto Building
LOS ANGELES.....1423 Wm. Fox Building

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shot with 15 quarts, swabbed 75 bbls. Williams and others No. 8 Smith, NE SW NE Section 20-7n-3e, Weiler sand at 1,533-44 feet, pumped 75 bbls. Shell Petroleum Corp. No. 3 Milliser, SE NE NE Section 29-7n-3e, Cypress sand at 1,544-80 feet, shot with 21 quarts, pumped 70 bbls. Stewart Oil Co. No. 4 Griffith, SE SW SW Section 29-7n-3e, Weiler at 1,590-1,605 feet, pumped 250 bbls. Carter No. 4 Griffith, SE NW NE Section 31-7n-3e, Weiler at 1,537-49 feet, shot with 10 quarts, swabbed 142 bbls.

In Richland County, Pure Oil Co. No. 5 Wakefield, NE NW NE Section 26-4n-9e, Noble field, total depth 2,613 feet, plugged back to 2,596 feet, and shot in Weiler sand at 2,577-96 feet, pumped 287 bbls. Pure No. 7 Wakefield, SE NE NW Section 26-4n-9e, Weiler at 2,576-96 feet, pumped 113 bbls.

In Lawrence County, Kentucky Natural Gas Co. No. 1 Benson-White, NW cor. NE NW NW Section 18-4n-10w of second principal meridian, Bridgeport sand at 805 feet, Buchanan sand at 1,120-28 feet, 2,500,000 cu. ft. of gas per day.

In Clay County, Pure Oil Co. No. 4 J. H. Smith, SW NE SW Section 33-3n-8e, Clay City pool, showings at intervals from 2,920 to 3,036 feet, acidized with 567 gallons, and then with 5,000 gallons, pumped 31 bbls. of oil.

In the Sandoval pool in Marion County, Menhall Oil Corp. No. 1 Illinois Central Railroad, a Devonian lime test, was abandoned at 3,021 feet. The log shows tops as follows: Glen Dean at 1,218 feet, Golconda at 1,285 feet, Cypress at 1,409 feet, Benoist at 1,518-42 feet, Aux Vases at 1,572 feet, lower Mississippian at 1,645 feet, Fredonia at 1,750 feet, St. Louis at 1,800 feet, Salem at 1,895 feet, Osage at 2,270 feet, Chattanooga at 2,892 feet, Devonian at 2,970½ feet, saturation at 3,015-20 feet, drill stem test opened 20 minutes, recovered 460 feet of salt water.

In the Salem field in Marion County, W. C. McBride, Inc., No. 2 N. L. Lee, SE NE SE Section 29-2n-2e, Benoist sand at 1,739-79 feet, swabbed 408 bbls. Texas Co. No. 7 Tate, NE SE SW Section 31-2n-2e, Benoist at 1,736-74 feet, flowed 40 bbls. in three hours, rated a 280-bbl. well. Magnolia Petroleum Co. No. 31 J. H. Young, NE NE SE Section 20-2n-2e (corrected location), Bethel at 1,763-1,802 feet, shot with 40 quarts, flowed 600 bbls. Texas Co. No. 6 E. Gett, NW SW SE Section 16-2n-2e, Benoist at 1,803-38 feet, pumped 25 bbls. in three hours, rated a 175-bbl. well. Texas No. 3 F. Shanafelt, SE NW NE Section 16-2n-2e, Benoist at 1,838-71 feet, pumped 19 bbls. in three hours, rated a 133-bbl. well. Texas No. 3 A. J. Sweeney, SE SE SW Section 17-2n-2e, total depth 1,875 feet, plugged back to 1,856 feet and then to 1,831 feet, and redrilled to Benoist sand topped at 1,854 feet, flowed 53 bbls. in three hours, rated a 370-bbl. well. Texas No. 5 Chapman, SW NE SW Section 28-2n-2e, Benoist at 1,773-1,824 feet, flowed 39 bbls. in three hours, rated at 273 bbls. a day. Hull, Stouffer and others No. 1 Martin, SW SW SW Section 10-2n-2e, McClosky lime at 2,094 feet, total depth 2,136 feet, acidized with 4,000 gallons and 500 gallons, pumped 25 bbls. of oil and 50 bbls. of salt water. Shell Petroleum Corp. No. 11 Allison, SE SW NE Section 12-1n-1w, Bethel sand at 1,366-82 feet, shot with 3 quarts, pumped 35 bbls. in 19 hours.

In the south end of the Salem field, Texas Co. No. 4 Heydrick, NW NW SE Section 9-1n-2e, Benoist at 1,879-92 feet, pumped 40 bbls. in three hours, rated a 280-bbl. well. Texas No. 2 Snider, SE SW SE Section 8-1n-2e, McClosky lime at 2,108-13 feet, acidized with 2,000 gallons, flowed 75 bbls. in three hours, rated at 525 bbls. a day. Texas No. 4 G. Johnson, NE NW SE Section 6-1n-2e, Benoist at 1,735-57 feet, flowed 44 bbls. in three hours, rated a 308-bbl. well. Texas No. 10 Small, NE cor. Section 5-1n-2e, Benoist at 1,777-1,822 feet, flowed 69 bbls. in three hours, rated a 483-bbl. well. Texas No. 8 Small, NE NE NE Section 5-1n-2e, McClosky top at 1,991 feet, showings at 1,991-94 feet, pay at 1,994-2,002 feet, showing at 2,002-05 feet, flowed 20 bbls. in three hours, rated a 140-bbl. well. Texas No. 5 J. Richardson, SE SE NW Section 5-1n-2e, Benoist at 1,694-1,744 feet, flowed 54 bbls. in three hours, rated a 378-bbl. well. Texas No. 8 Kalkbrenner, NE SE SW Section 5-1n-2e, flowed 27 bbls. in three hours through 1-inch choke, rated a 189-bbl. well. Texas No. 9 O. Johnson, NE SE SW Section 5-1n-2e, Benoist at 1,746-81 feet, flowed 30 bbls. in three hours through 1-inch choke, rated at 210 bbls. a day. Texas No. 8 O. Johnson, SE SE SW Section 5-1n-2e, McClosky lime at 1,965 feet, pay at 1,968-71 feet and 1,972-76 feet, flowed 35 bbls. in three hours through 1-inch choke, rated a 245-bbl. well. Texas Co. No. 19, City of Centralia land, NE cor. SW NE NE Section 5-1n-2e, Benoist at 1,749-1,803 feet, flowed 75 bbls. in three hours, rated at 524 bbls. per day. Texas No. 14, Centralia land, NW cor. Section 4-1n-2e, Benoist at 1,777-1,830 feet, flowed 46 bbls. in three hours, rated a 322-bbl. well. Texas No. 17 Kalkbrenner, NW cor. SE SE SW Section 5-1n-2e, McClosky lime at 1,972-86 feet, flowed 87 bbls. in three hours, rated a 600-bbl. well. Hollingsworth No. 7 Kalkbrenner, NW cor. SE SE SW Section 5-1n-2e, McClosky ay at 1,908-91 feet, flowed 420 bbls. in 10 hours, rated a 1,000-bbl. well. This well is on a narrow strip of land and is closely offset by Texas Co. along with all the other Hollingsworth wells on the strip. Tide Water Associated Oil Co. No. 4 Miller, SW NE NE Section 18-1n-2e, had Bethel sand at 1,881-96 feet, and swabbed 17 bbls. the first hour. It was not yet a completion. Hawley Oil Co. No. 1 Albert, NW cor. SW NE NW Section 3-1n-2e, dry and abandoned at 2,156 feet. It had water in Cypress, Benoist and McClosky lime. Rockhill No. 6 Foster, SW SW SW Section 8-1n-2e, was dry and abandoned at 1,852 feet, Bethel at 1,821-31 feet, tested water.

In Clay County, Pure Oil Co. No. 12 C. B. Clay, C E half NE NW Section 26-1n-7e, was dry and abandoned at 3,350 feet, St. Louis lime was topped at 3,332 feet. Pure Oil Co. No. 1 R. Barnard A, C W half SW NE Section 34-1n-7e, Fredonia at 3,118 feet, pays at 3,120-28 feet and 3,031-37 feet, flowed 267 bbls. through perforated casing.

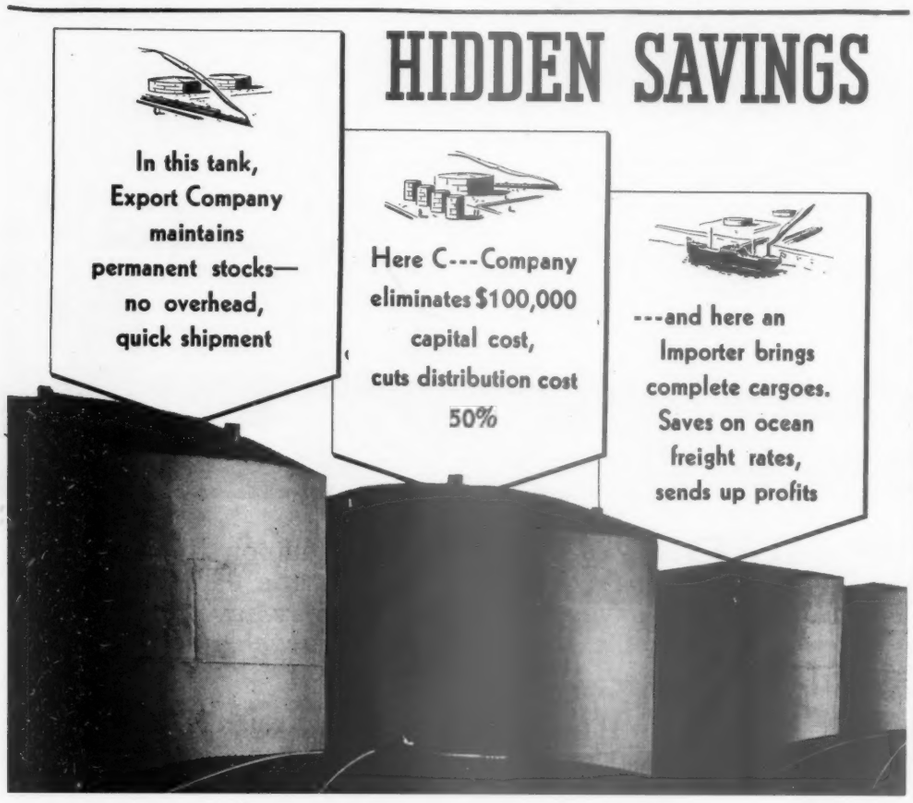
In Wabash County, Taylor Drilling Co. No. 1 Schafer, SW SW SE Section 28-1n-12w of second principal meridian, was dry and abandoned at 2,347 feet. McClosky lime at 2,340-47 feet was given a drill stem test for 10 minutes resulting in the recovery of 180 feet of oil and 480 feet of salt and sulfur water.

In Washington County, Pitchford No. 1 Hafer, SE cor. SW SW Section 22-1s-1w, was abandoned at 763 feet after Petro sand at 714-46 feet showed water.

In Jefferson County, Pyramid Petroleum Co. No. 1 Trout, SW SE SE Section 19-2s-2e, was dry and abandoned at 2,595 feet, with St. Louis lime topped at 2,589 feet.

In Randolph County, Badger Oil Co. No. 1 Schroeder, SW NW NW Section 27-6s-6w, was dry and abandoned at 2,305 feet. It was given a 140-quart shot in Trenton lime topped at 2,660-2,305 feet, but only a showing of oil and a lot of water resulted.

In Brown County, in western Illinois, Ripley Oil Trust No. 1 Reich, NE cor. NW SW SE Section 15-1s-2w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of fourth principal meridian, was dry and abandoned at 642 feet. Niagara lime was topped at 605 feet.

In Clay County, Pure Oil Co. No. 1 Schott, C W half NE SW Section 5-2n-8e, Fredonia lime pays at intervals from 2,985 to 3,084 feet, flowed 1,010 bbls. in 24 hours.

In the Centralia pool in Clinton County, Shell Petroleum Corp. No. 11 Allison, SW cor. NE NW SE Section 12-1n-1w, Bethel sand at 1,361-75 feet, shot with 10 quarts, pumped 48 bbls. of oil and 6 bbls. of water.

Among the Wildcats

In Champaign County, Sidney Oil & Gas Co. No. 1 Wendling, SW SE NE SE Section 10-17n-10e, was drilling below 1,000 feet.

In Macon County, Decatur Oil & Gas Co. No. 1 Cook, NE SW SE Section 21-15n-2e, unconfirmed report says this test had a showing of oil at about 1,300 feet and at about 2,900 feet.

In Christian County, Oil Development Co. No. 1 Post, SE SW NW Section 1-14n-1w, drilling at 1,320 feet. St. Louis lime topped at 1,130 feet. Benoist sand in this test was topped at 1,055 feet.

In Shelby County, Rex Development Co. No. 1 Odell, NE SE NW Section 20-14n-2e, drilling at 100 feet. Swords and McDougal No. 1 Dorst, NW NW NW Section 17-11n-2e, shut down for repairs at 1,435 feet. Corn and others No. 1 Wabash Railroad, C N half N half Section 27-10n-3e, hole full of water at 1,865-75 feet, total depth 1,890 feet, shut down for orders. Joe Aylward No. 1 Bickford, NW SW SE Section 7-9n-5e, Weiler sand at 1,824 feet, also a sand at 1,905 feet, total depth 1,974 feet, dry and abandoned.

Edgar County, Robe & Henderson No. 1 Sarah Wait, C NE NE Section 16-12n-13w of second principal meridian, C NE NE Section 16-12n-13w, total depth 705 feet, fishing for tools.

In Coles County, R. E. Wheless No. 1 Michaels, SW SW NW Section 1-11n-7e, pumped 27 bbls. of fluid in 12 hours, approximately 50 per cent oil, testing.

In Cumberland County, Jarvis Brothers No. 1 Wilson Estate, NE NW NW Section 21-10n-7e, total depth 2,326 feet, fishing for drill pipe. Doran and others No. 1 Haskett, C W half W half W half Section 15-10n-7e, spudded.

In Clark County, Leland Wagner No. 1 Baughman, SW cor. NE NW SE Section 20-9n-14w, total depth 975 feet, shut down for repairs.

In Crawford County, Snavely and others No. 1 Hostettler, SW NW SW Section 31-8n-11w, total depth 1,328 feet, running 8-inch casing.

In Greene County, Edrie Drilling Co. No. 1 Steele, NE NE SE Section 1-8n-14w, sand which may be St. Peter at 450 feet, shut down at 460 feet.

In Jasper County, National Consumers No. 1 Leaman, NW SW SW Section 4-8n-14w, McClosky lime top at 1,329 feet, streaks of saturation from 1,329 to 1,362 feet, set 4½-inch casing at 1,323 feet.

In Bond County, Reisigg and Quesenberry No. 1 Wilderman, NE NE NE Section 3-6n-3w, drilling at 1,340 feet. Kesl and others No. 1 Sathopp, NE NE NW Section 12-6n-5w, shut down at 150 feet.

In Crawford County, Snavely and others No. 1 Mann, NW NW SE Section 18-6n-12w of second principal meridian, set 12½-inch casing at 150 feet (corrected location).

In Fayette County, Glassco & Lewis No. 1 Wagner, NW NW NE Section 30-6n-3e, Benoist at 1,769-84 feet, set 5½-inch casing at 1,771 feet and drilling plug.

In Clay County, Richard Duncan No. 1 Liggett, SE NW SE Section 17-5n-5e, shut down at 2,356 feet. Burnett and others No. 1 Smith, NE NW SE Section 21-5n-5e, drilling at 2,190 feet.

In Fayette County, Martin and others No. 1 Davis, C SW NE Section 7-5n-1w, total depth 1,455 feet, will core ahead.

In Madison County, Harry Hazlett No. 1 Wetzel, SW SW SE Section 12-5n-6w, saturation in Devonian lime at 1,888-95 feet, total depth 1,916 feet. Will plug back and test.

In Bond County, Lindsay Brothers and others No. 1 Butler, NE NE SW Section 31-4n-2w, top of the Devonian lime at 2,449 feet, total depth 2,454 feet, filled up 500 feet with fluid in 1 hour and 50 minutes, 50 to 60 per cent oil on top. No additional fill-up in the next 24 hours. Shut down for orders. Joe Kesl and others No. 1 Meyer, NW NE NW Section 13-4n-2w, Ste. Genevieve lime at 1,394 feet, set 5½-inch casing at 1,400 feet, shut down at 1,520 feet with 200 feet of sulfur water in the hole.

In Lawrence County, Salvage Oil Co. No. 1 Trimbley, SW NE NW Section 5-4n-12w of second principal meridian, material on ground.

In Richland County, Worthy E. Dyer No. 1 Wheeler, SW NE NE Section 24-4n-9e, shut down at 1,140 feet.

In Marion County, John Q. Gill No. 1 Brown, SW SW SW Section 5-3n-3e, drilling at 2,135 feet.

In Clay County, F. Kroeger No. 1 Chaney, NW SW SW Section 18-3n-7e, total depth 2,535 feet. Will move in rotary tools.

In Clinton County, Lindsey Brothers and British American No. 1 Boenhoff, NW NW NE Section 34-3n-4w, total depth 680 feet, will run 8-inch casing. Noelkemper & Murphy No. 1 Kile, SE cor. NE Section 11-3n-3w, drilling at 895 feet.

In Madison County, L. C. Simmel and others No. 1 Keller, NE NE SE Section 7-3n-8w, drilling at 220 feet. H. Flannery and others No. 1 Gerdes, NW NE SE Section 3-2n-2w, total depth 870 feet; may skid rig when water goes down. Petroleum Service, Ltd., No. 1 Botts, NW SW SW Section 17-2n-2w, total depth 1,113 feet, shut down for orders.

In Richland County Leathers and others No. 1 Yonaka,. NW SE SW Section 22-4n-14w of the second principal meridian, shut down at 2,710 feet.

In Wayne County, Pure Oil Co. No. 1 Evans, C W half SW NE Section 28-2n-8e, Fredonia lime at 3,001 feet, pays at 3,034-41 feet, 3,045-48 feet, 3,053-60 feet, drilling at 3,075 feet. Thompson Drilling Co. No. 1 Briscoe, C W half SW NW Section 21-2n-7e, Fredonia at 3,135 feet, showing of oil at 3,145-47½ feet, total depth 3,149 feet, shut down. George A. Manahan No. 1 E. Fitch, C N half SE NE Section 10-1n-8e, drilling at 2,290 feet. Pure Oil Co. No. 1 Behyner, C W half SE NE Section 4-1n-8e, drilling at 2,540 feet. Witcher Development Co. No. 1 Fitch, C N half SE SE Section 3-1n-8e, set 5½-inch casing at 3,082 feet, pay at 3,087-93 feet, shut in for storage. George A. Manahan No. 1 D. Fitch, C N half SW SE Section 3-1n-8e, drilling at 1,740 feet.

In Marion County, Cameron and others No. 1 Dolly, NE cor. NW NE Section 19-1n-2e, rigged up rotary. Johnson and Betts No. 1 Johnson, NE NW NE Section 32-1n-1e, total depth 1,923 feet, moving in rotary tools. Hawley Oil & Gas Co. No. 1 Copple, SW SW NE

(Continued on Page 155)

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Eastern Field Report

By STAFF CORRESPONDENT

Two Deep Tests in Fayette County Are in the Gas Pay

PITTSBURGH, Pa., Feb. 20.—Two of the deep tests drilling on Chestnut Ridge in Fayette County, Pennsylvania, have reached the gas pays in the cherty zone of the Onondaga limestone. In South Union Township, New Penn Development Co., William E. Snee and others struck the first gas at 6,960 feet, and at 6,965 feet there was a volume of 260,000 cu. ft. a day which increased to 500,000 feet a day at 6,967 feet. The well was 6,972 feet deep on last report. It is on the Indian Creek Coal & Coke Co. William Johnson warrant, about 2.8 miles southwest of the junction of the U. S. Route 40 and the Jumonville road. The elevation of the derrick floor is 2,633 feet and the chert was topped at 6,923 feet or minus 4,290 feet. This is the third test of these operators on this structure with both previous tests having been completed as commercial gas wells.

North of Route 40 in North Union Township, Wasson & Co. shut down at 6,965 feet in the test on the J. H. Sorg farm, with the first gas showing in the Onondaga at that depth. A new drilling line will be installed before going deeper. Here, the cherty zone in the Onondaga was topped at 6,930 feet, or subsea minus 4,345 feet.

Twenty operations were completed in the lower eastern fields during the past week of which four were dry holes, 14 gas wells and two producers with a daily initial of 24 bbls.

SOUTHWEST PENNSYLVANIA

No wells were completed in Southwest Pennsylvania during the week, and little new work is starting. In Monongahela Township, Greene County, the Monongahela Oil & Gas Co. drilled No. 3 Vance Heirs through the Fifty-foot sand 1990-2,025 feet, which was dry and it is being plugged back to the second Salt sand to try and save that gas. In this township, Brummage and others are drilling at 1,862 feet deepening No. 1 S. G. Durr.

In Morris Township, Greene County, C. H. McVay and others are drilling at 2,500 feet on the Elmas Laughman farm with the Big Injun sand at 2,136-2,400 feet. O. I. Dillie is down 188 feet in the second test on the Ellsworth Beckham farm.

In Franklin Township, Greene County, J. B. Myers and others have reached 928 feet on the Sallie Morris farm. Gartland Oil Co. deepened No. 1 J. L. Donley, with the Bayard sand at 2,947 feet and a show of oil at 2,948 feet and drilling at 2,958 feet. In Richhill Township, Burley Wright has a rig up on the Strawn heirs farm.

In Washington County, Beedle & DeBone and others topped Fifth sand at 2,516 feet on the J. C. McNary farm with 100,000 cu. ft. of gas at 2,520 feet and is drilling down to the Speechley sand. It is in North Strabane Township. In Hopewell Township, McFadden & Co. is down 1,170 feet in the test on the J. W. Reed farm.

In Allegheny County, Young Brothers reached 1,976 feet or the bottom of the Hundred-foot sand in the test on the James Sturgeon farm with water in the hole and are running 5 1/2-inch casing.

Deep Tests

In Mercer County, Carnegie Natural Gas Co. is plugging the test on the A. S. McCullough farm in Jefferson Township at 5,485 feet. The Clinton sand was topped at 5,343 feet; it proved very hard and void of any showing.

On Chestnut Ridge in Springhill Township, Fayette County, the L. J. Houze Convex Glass Co. is still fishing for the tools and line in the Onondaga in the test on the Paul Dunham farm. The depth was about 7,625 feet with gas still coming from 7,609 feet.

In Armstrong County, the Peoples Natural Gas Co. is drilling at 734 feet in the deep test on the Lowry Martin farm in Wayne Township.

SOUTHEAST OHIO

In Harrison County, Southeast Ohio, Columbian Carbon Co. deepened the test on the George D. Miller farm near Cadiz Junction in Section 23, German Township, to 5,250 feet and shut down, and will plug the test. The surface elevation was 1,223 feet with the Berea sand at 1,384 feet; Oriskany 4,769-90 feet.

In Athens County, Williams Brothers completed a test on the Emma Lovett farm in Section 6, Lodi Township, in the second Berea sand at a depth of 1,720 feet. It is a gas well gauging 124,000 cu. ft. a day.

In Coshocton County, the Blue Rock Oil Co. drilled a test on the Roy Rine farm in the northeast quarter Section 4, Perry Township, through the Clinton sand to 3,110 feet and it was a dry hole.

In Hocking County, the Griffin Producing Co. completed a fair gas well in the Marlow Oil Co. No. 10 in Section 30, Green Township, in the Clinton sand topped at 2,892 feet with a total depth of 2,919 feet. The final gauge was 1,000,000 cu. ft. a day.

In Knox County, C. A. Davis and others completed a test on the Noah Martin farm in Section 25, Clay Township, in the lime at 2,110 feet as a gas well gauging 368,000 cu. ft. a day.

In Licking County, C. A. Davis completed a well on the Clemens and Cullison lease, 1 mile north of the city of Newark in the Clinton sand at 2,540 feet as a gas well gauging 800,000 cu. ft. a day. On city lots in Newark Township, and known as the Clemens and Cullison lease, C. A. Davis and others completed a gas well in the Clinton formation at 2,554 feet, gauging 700,000 cu. ft. a day.

In Medina County, Independent Eastern Torpedo Co. and others completed No. 5 W. P. White, Lot 17, Harrisville Township, in Berea grit at 482 feet. It produced 20 bbls. the first day after a shot. In Tract 4, Lot 1, Chatham Township, R. O. Grim and others completed No. 4 B. E. Grim in Berea grit at 446 feet. It produced one-fourth barrel the first day and the operators will probably not shoot or produce it.

In Perry County, Atha Oil Co. completed a well on the Ross Wilkins farm in Section 7, Madison Township, in Clinton sand at 3,110 feet. It has a gas volume of 75,000 cu. ft. per day and will probably make a 10-bbl. pumper along with the gas.

WEST VIRGINIA

One small producer was completed in West Virginia during the week. In Union district, Ritchie County, the test of Moats & Barker on the W. S. Fowler farm was dry in the Injun sand and was deepened to the Squaw sand from which formation there is 4 bbls. a day with 340,000 cu. ft. of gas.

In Gilmer County, Kidd & Marsh completed the test on the Glennville State Teachers College in Glenville district at 1,725 feet with the Big lime at 1,563-1,662 feet; Big Injun 1,662 feet and 1,250,000 cu. ft. of gas at 1,662 feet.

In Lewis County, the Pittsburgh & West Virginia Gas Co. No. 7650 on the J. B. Brannon farm in the Court House district was dry and abandoned at 2,726 feet.

In Marion County, R. H. Monroe & Co. completed the test on the W. Watson farm in Mannington district in the Thirty-foot sand at 3,140 feet as a small gas well gauging 25,000 feet a day.

In Ritchie County, P. M. Lemon completed a gas well on the M. M. Morton farm in Grant district in the Injun sand at 1,950 feet. It gauged 250,000 cu. ft. a day. In this district, Heneghan & Hanlon deepened No. 3 William Arnett through the Squaw sand and have a light gas well. In Murphy district, W. R. Hays completed No. 5 Levi Wilson farm in the Injun sand at 2,030 feet. It is a gas well gauging 94,000 feet a day.

In Wayne County, United Fuel Gas Co. completed No. 4284 on the A. J. Fry farm in Union district at 3,321 feet as a gas well gauging 184,000 feet a day 48 hours after shot.

In Lincoln district, Wayne County, Kentucky-West Virginia Gas Corp. drilled No. W-56 on the Wayne B. Ferguson farm to 2,958 feet and abandoned it as a dry hole.

Oriskany Gas Field

Two wells are being completed in the Oriskany gas field in Kanawha County. In the Poca district, the United Fuel Gas Co. is drilling at 4,848 feet in No. 4818 W. H. Fisher farm with the Corniferous lime at 4,725 feet; Oriskany 4,832 feet and 3,120,000 cu. ft. of gas showing.

In this district, Godfrey L. Cabot, Inc., is drilling at 4,992 feet on the Putnam Co. lease with Corniferous lime topped at 4,875 feet; Oriskany 4,989 feet and a volume of 523,000 cu. ft. of gas.

In this district, the South Penn Oil Co. ran casing to 5,012 feet, the Corniferous lime, in the test on the J. A. Monk farm and is drilling in the top of the Oriskany sand. The final gauge of the test of the United Fuel Gas Co. on the C. O. Slater and others No. 4807 was 1,984,000 feet a day at 5,117 feet.

Outside Deep Tests

In Ravenswood district, Jackson County, 2 miles west of Lockhart, Joe Rubin, N. P. Johnston and others are shut down for repairs at 2,253 feet in the test on the D. P. Curry farm. There was a showing of gas in the Berea at 2,193 feet. In Ripley district, 6 miles southwest of the town of Ripley, the Columbian Carbon Co. is drilling at 1,067 feet on the G. W. Lathey farm. Everett Starcher is drilling at 2,650 feet on the R. R. Boggess farm, Ripley district, an extension of the Kanawha County Oriskany gas field.

In Grant district, Pleasants County, the Columbian Carbon Co. is shut down at 4,812 feet on the Giles Hammat farm and fishing for a cement reamer. In this test, casing is being carried and the hole underreamed.

New Work

Few new locations were announced during the week. In Calhoun County, South Penn Oil Co. started drilling on the Henry Brannon farm in Sherman district. W. H. Bickel is drilling at 1,450 feet in No. 2 Barr and Gunn and others at 900 feet on the same tract. H. S. Adams heirs are down 1,311 feet on the F. M. Wilmoth heirs land. In Lee district, Everett Starcher is at 2,285 feet testing the Injun sand in No. 3 C. C. Starcher. D. A. Cronin is running 6-inch casing at 1,600 feet in No. 2 Bruce Bell, Sheridan district.

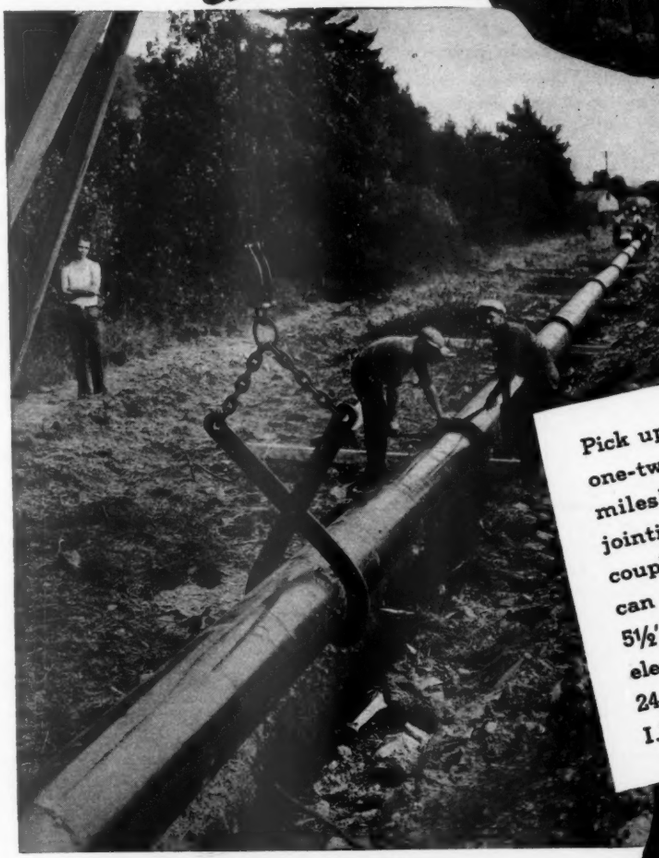
In Gilmer County, the Pittsburgh & West Virginia Gas Co. made a location for No. 7,665 A. L. Cottrill farm in Glenville district, elevation 1,108 feet, and has reached 1,632 feet in No. 7654 Alexander Lyons. In DeKalb district, L. E. and W. H. Mossor are down 1,750 feet in the S. S. Riddle test. McKnight & Whiting are drilling at 1,875 feet in the A. B. and J. D. Vannoy test.

In Clay County, the Elk River Gas Co. is drilling at 1,095 feet in the J. S. Brown test in Pleasant district. In Kanawha County, Malden district, Ten Mile Oil & Gas Co. is down 1,283 feet in No. 20 Margaret Y. Dickinson. In Nicholas County, Hope Natural Gas Co. is spudding No. 7822 C. & H. Corp. in Jefferson district.

In Mingo County, W. E. Burchett is drilling at 2,865 feet on the B. F. Meade farm in Kermit district, with a

(Continued on Page 152)

"WHAT A LOT OF PIPE A MERE HANDFUL OF WORKMEN CAN LAY—WHEN IT'S A DRESSER-COUPLED LINE!"



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NOTE TO READER: This is the twenty-fourth in a series of advertisements dramatizing one engineer's experience with his first Dresser-coupled line. For the complete story, write for Bulletin 351.

Big Producers and Important Extensions in Western Area

By
D. H. STORMONT

FORT WORTH, Tex., Feb. 20.—Development in Hockley County's Slaughter pool and in several separate pools in Ector County, together with definite plans for two new North Permian basin outlets which are expected to greatly stimulate drilling in the next few months, led the week's development in the West Texas district.

Jones County, for another week, highlighted the active areas in West Central Texas with important developments in four different pools throughout the county.

One mile northeast of the northwest portion of the Slaughter pool of Hockley County, Sid W. Richardson No. 1 A. E. Coe is preparing to acidize and complete. The well has definitely assured a major extension to the pool, and after drilling to a total depth of 5,185 feet has plugged back to the best zone of saturation, found from 4,967 to 5,145 feet. The well indicated record production for the pool when it made several 25-minute heads, each estimated at 30 bbls., while pulling the drill pipe. No. 1 Coe has shown almost continuous pay in coring from 4,893 feet to its present plugged-back depth. It is located in Labor 53, League 40, Maverick County School Lands.

Record potential for Yoakum County was reported at J. E. Mabee No. 4 Willard, completed for an initial of 3,137 bbls. of oil daily to extend the southwestern end of the Bennett pool about a quarter of a mile. No. 4 Willard, located 2,200 feet from the north and west lines of Section 741, is a location south of the same operator's No. 3 Willard, completed recently for 3,116 bbls. daily. The wells are on the southwest corner of the Bennett pool, and it is thought by some that their greater potentials further the idea of a single structure for the Wasson pool and the Bennett pool.

Exercises Option

The Aloco Oil Co. of Dallas has exercised its option taken last December for the acquisition of Texas Co.'s producing and undeveloped leases in the Yoakum County portion of the Wasson field and in the Bennett pool. The deal involves 17 oil wells, completed prior to the option date, and four additional wells completed within the past two weeks. The area acquired amounts to approximately 16,000 acres, of which about 7,000 are considered proven for oil production. A 200-well drilling campaign has been projected by the Aloco company for the properties.

Southern Basin Area

A half-mile northeast extension to the North Cowden pool and the staking of four wildcat locations in as many counties led the development in the southern basin area.

Half-mile east extensions to the extreme north end of production in the North Cowden pool of Ector County was indicated by Texas Pacific Coal & Oil Co. No. 1 Holt, Section 19, Block 43, T.&P. Survey. The well was drilling ahead below 4,390 feet, with the pay section of the field expected in the next few feet. At 4,275 feet the well was reported to have filled 400 feet with oil.

A wildcat test 1½ miles to the west of production in the North Cowden pool, Continental Oil Co. No. 1-8 Wight, Section 8, Block 43, T.&P. Survey, has been ordered plugged and abandoned. The test encountered sulfur water in drilling to 4,411 feet.

Seeking a 1¾-mile southwest extension to Crane County's Dunes pool, Magnolia Petroleum Co. No. 1-18 University, wildcat test in Section 18, Block 30, University Lands, was drilling below 3,000 feet. The Dunes pool was discovered in 1938 and has shown the most rapid development of any new area opened in West Texas during that year, there being some 10 completed wells in the field at present.

A new wildcat test for central Howard County was seen when Dick Graham and associates staked their test approximately 3 miles northeast of Big Springs. The test is No. 1 Pete Johnson, in the NE cor. of Section 45, Block 32, T.&P. Survey. Located 10 miles due west of the Coahoma pool, the wildcat is only a half mile northwest of a failure on the Brooks lands.

Glasscock County received a new wildcat location when B. A. Duffy staked No. 1 Carter-Shell in Section 8, Block 33, T.&P. Survey. The operators are rigging up material for immediate spudding.

In Tom Green County, Dan Short and associates are moving in materials for their proposed 3,500-foot wildcat on the J. G. Davidson lands. The test is located in the northwest corner of the Lovie P. Moore Survey.

Winkler County's new wildcat operation is the Standard Oil of Texas No. 2 Baird. Operators are building derrick for the test, which is located in Section 13, Block 3-B, P.S.L. Survey.

WEST CENTRAL TEXAS

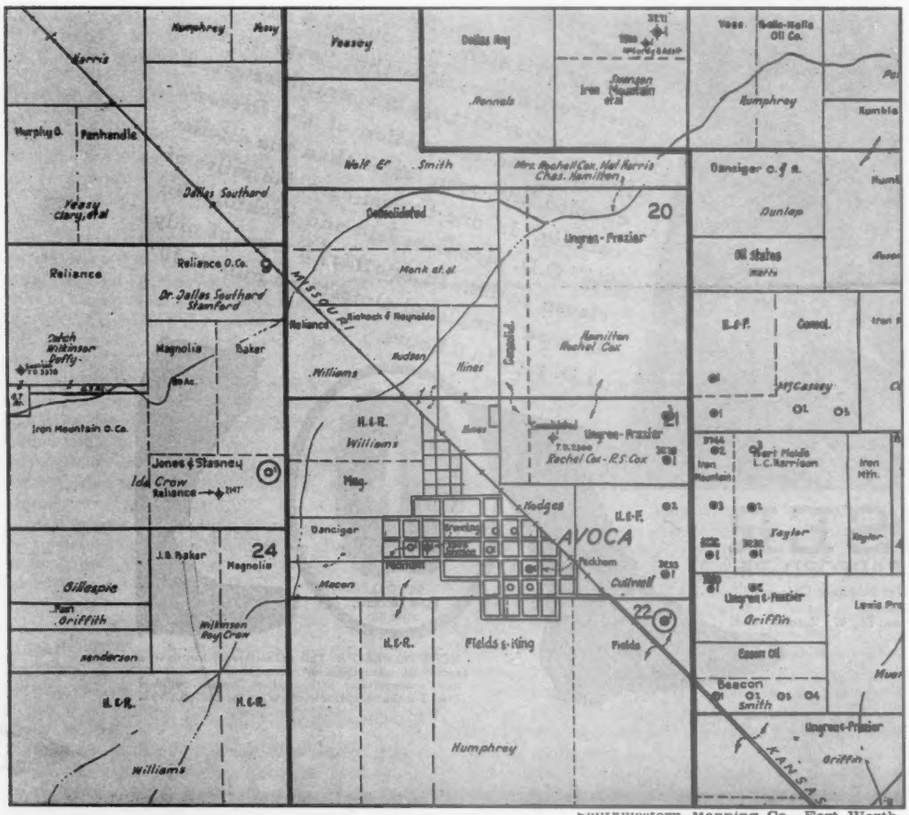
Jones County, the "hot-spot" of West Central Texas' oil operations, has just passed another very busy week. Completions and new locations featured the Griffin pool's development, two new semiwildcat locations were staked projected to the deep Swastika lime in the county's Noodle Creek pool, indicated production at an outpost to the Sandy Ridge pool highlighted that area, possible production was seen at an outpost to the Akard pool, and two new wildcats were staked in the county to make a total of some 10 active exploratory tests for the county.

Major developments in the Griffin pool included the completion of Iron Mountain Oil Co. No. 3 Taylor for an initial of 1,810 bbls. daily from the lime from 3,208-29 feet; a one-location north extension of the field by Consolidated Oil Co. when its No. 1 J. A. McCaskey, Section 194, logged the Palo Pinto lime from 3,251 feet to 3,265 feet, and the possibility of production in Peckham No. 1 Avoca School District, west outpost to the field and between the field and the recent dry hole by Fred Browning. The Peckham well is preparing to pump, the best flow obtained at the well having been 70 bbls. hourly on initial tests. The well has the pay section at 3,272-80 feet. Within the townsite W. H. Peckham will spud his second test, in the B. C. Humphrey tract of Block 4, southeast of his first well. A new south outpost for the pool which was spudded as the week closed was the Beacon Oil Co. No. 1 Smith in the SW cor. Section 199.

The Noodle Creek pool of Jones County is in line for two new operations as Sidney P. Smith has filed an application with the Railroad Commission to drill two semiwildcat tests to the deep Swastika sand recently opened by the Humble Oil & Refining Co.

One of the tests will be in the Claude Jenkins lot, on the edge of the Noodle townsite, Section 47-18, T.&P. Survey. The Noodle School campus offsets the two and one-half acre tract to the south. The second test will be in the Ella Howard lot of three acres, in Section 48-18.

The west outpost to the Sandy Ridge pool, L. H. Pearson No. 1 J. H. White, is indicating a small producer from the sand at 1,777 feet. The test was acid-



Southwestern Mapping Co., Fort Worth

Jones County's recently discovered Griffin pool is the most active area in West Central Texas at the present time

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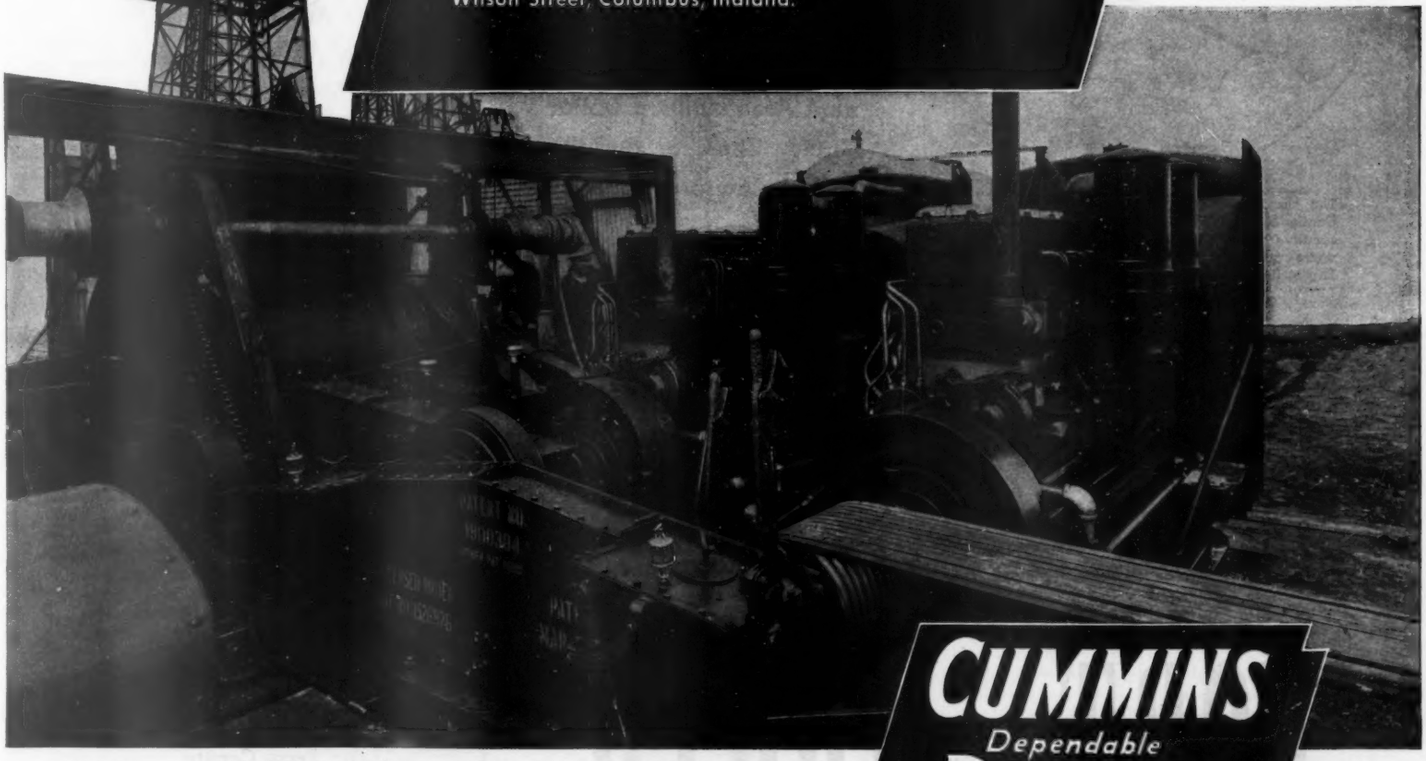

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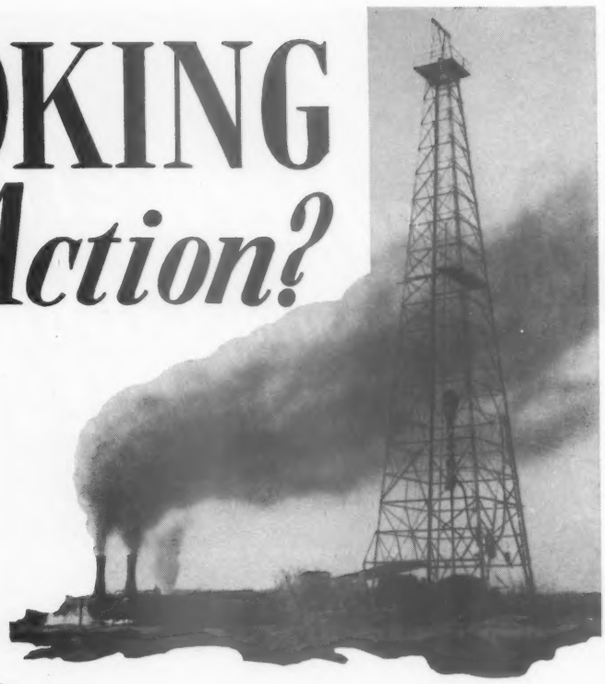

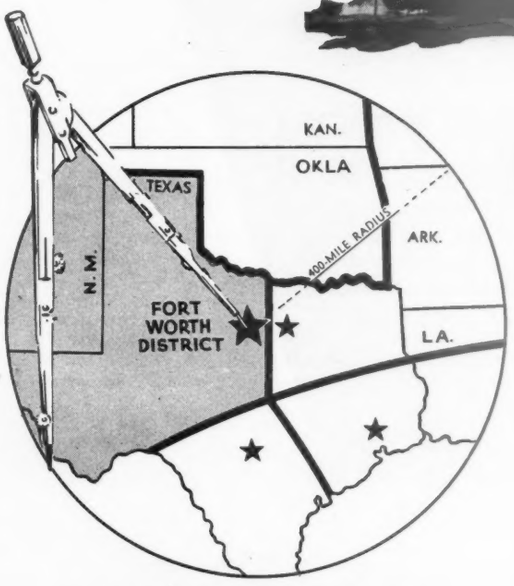

The chart above shows the Districts in the Mid-Continent Area. The table below covers four consecutive years and gives the number of rigs and wells drilling (averaged first of each month). These figures compiled from The Oil and Gas Journal.

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Mid-Continent Area	1935	1936	1937	1938
Fort Worth District...	**819**	**934**	**1171**	**1071**
Dallas District	502	502	496	316
Houston District	244	233	284	258
San Antonio District	171	240	269	241
Oklahoma District	566	560	476	339
Kansas District	255	344	430	234

For Specific Surveys and detailed information regarding Fort Worth opportunities, write the OIL AND GAS COMMITTEE,

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FORT WORTH

Heart of the Mid-Continent Area

ized with 1,000 gallons at the present depth, plugged back from 2,325 feet.

The east outpost to Jones County's Lewis pool, Fain & McGaha Oil Corp. No. 1 Shaheen showed a record well for the area in flowing 103 bbls. of oil in one and a half hours after the pay zone from 1,892 feet to 1,908 feet was shot with 40 quarts. It is in the SW quarter of Section 36-15, T.&P. Survey. A location west of the Fain & McGaha well, Danciger Oil Refineries, Inc. No. 5 Roberts made 326 bbls. in 24 hours.

At the north outpost to the recently discovered Akard pool of Jones County, L. A. Hedrick is deepening his second test on the Akard lands after an estimated 2 or 3 bbls. of oil was netted from the 2 feet of saturation from 2,147-49 feet. The discovery well for the area was completed for 134 bbls. of oil daily from the pay section bottomed at 2,154 feet. The area is in the B. Martinez Survey of the central part of county.

Wildcat production in northwest Young County will be sought by Kenneth R. March and associates of Fort Worth in a test spudded in the south 100 acres of the Hunt & McClatchy lands, Section 79, T.E.&L. Survey, 8 miles southwest of Olney. The test will seek shallow production from the 1,200-foot horizon.

The Forest Development Corp. of Abilene which for several weeks has had three important wildcat wells drilling in as many West Central Texas counties, has abandoned its Taylor County and Scurry County wildcats and is preparing to test the one in Stonewall County. The corporation's No. 1 Boyd, located in Section 45, Block D, H.&T.C. Survey, about 5 miles northeast of Aspermont, found soft lime at 4,965 feet, and in coring to 4,702 feet, picked up oil stains. When cored to 4,708 feet, 2 feet of saturation was found and the well is preparing to test at that depth. The abandoned Taylor County wildcat was No. 1 T. C. Anderson, drilled in association with Carl B. King Drilling Co. and was dry at a total depth of 3,568 feet. Several attempts for production were made in the upper horizons as the operators plugged back. Location is in Section 8, L.A.L. Survey, 3 miles south of Abilene. The Scurry County abandonment was the corporation's No. 1 Koonsman, located just north of Camp Springs in the eastern part of the county, and was abandoned at a total depth of 5,004 feet.

WEST TEXAS FIELD COMPLETIONS

(24-hour tests)

Andrews County

Humble Oil & Refining Co. No. 18 R. M. Means, 4,500-4,550 feet, 2,707 bbls. Richmond Drilling Co. No. 1 Bryant-Link, dry and abandoned at 5,004 feet.

Coke County

Barnett Petroleum Co. No. 1 J. R. Mims, temporarily abandoned at 1,861 feet.

Concho County

A. J. Henning No. 1 A. E. Jones, dry and abandoned at 2,025 feet.

Crane County

Standard Oil Co. of Texas No. 1-4 University, dry and abandoned at 3,795 feet. Texas Co. No. 43 King, 2,340-2,400 feet, 34 bbls.

Ector County

American Maracaibo No. 1-C Scharbauer, 4,143-4,185 feet, 629 bbls. Atlantic Refining Co. No. 6-A Johnson, 4,100-4,245 feet, 333 bbls. Gulf Oil Corp. No. 156 Goldsmith, 4,131-91 feet, 1,120 bbls.; No. 159 Goldsmith, 4,130-4,215 feet, 560 bbls.; No. 160 Goldsmith, 4,120-93 feet, 1,412 bbls. Kewanee Oil Co. No. 1-A University, 3,329-3,653 feet, 2,339 bbls.; No. 2-A University, 3,332-3,650 feet, 853 bbls. Landreth Production Co. No. 4-A Johnson, 4,050-4,184 feet, 1,012 bbls.; No. 3-J Scharbauer, 4,157-4,210 feet, 386 bbls. J. E. Mabee No. 1 Slator, dry and abandoned at 4,305 feet. Phillips-Pure No. 54 Cowden, 4,121-76 feet, 2,415 bbls.; No. 56 Cowden, 4,110-67 feet, 925 bbls. Stanolind Oil & Gas Co. No. 9 J. E. Witcher, 3,990-4,205 feet, 470 bbls.; No. 10 J. E. Witcher, 3,990-4,176 feet, 1,382 bbls. Sunray Oil Co. No. 1-B J. E. Witcher, 4,087-4,238 feet, 754 bbls.

Pecos County

British American Oil Co. No. 21 Payton, 2,047-95 feet, 189 bbls. Cities Service Oil Co. No. 1 Dorr, location abandoned. H. G. Eastham No. 2 University, 1,600-20 feet, 446 bbls. Kone Production Co. No. 8

(Continued on Page 154)

Kansas Developments

By
DAL DALRYMPLE

Bemis Rating Is Increased to 588,966 Bbls. by New Tests

The taking of potentials by a productivity index based on the liquid levels obtained by the sound reflection method resulted in an increase in potential of the Bemis pool in Ellis County from 498,801 to 588,966 bbls. The new potential will not mean an increase in allowable for Bemis, but will result in a reallocation of allowables within the field. Maximum potential allowed any well was 3,500 bbls. daily.

Work of taking the new tests was under direction of E. G. Dahlgren and J. F. Haely of the Corporation Commission, cooperating with an executive committee selected by operators in the field at a meeting in Wichita, December 29. Floyd Lockhart, of Pryor & Lockhart, is chairman of the committee; other members are E. L. Birmingham, Margay Oil Co.; C. O. Moss, Deep Rock Oil Corp.; Max Mahaffey, Cities Service Oil Co.; H. E. Zoller, Shell Petroleum Corp.; Fred Malone, Magnolia Petroleum Co.; and M. Harrell, Texas Co.

New potentials for the Trapp and South Trapp field were scheduled to follow with the same method being used.

A three-fourths mile southward extension of the Leesburgh pool, Stafford County, was indicated at Continental Oil Co. No. 1 Russell, C SW NE Section 13-25-13w. Oil rose 3,000 feet in the hole in 30 minutes after plug in 7-inch casing set at 4,027 feet was drilled. Arbuckle lime was topped at 4,024 feet and cored from 4,039 to 4,041 feet, total depth, with some saturation.

Deep pay production apparently has been found in the new Fairfield pool in Russell County at Sinclair Prairie Oil Co. No. 1 Sellens, SW cor. Section 15-15-13w. It topped Arbuckle lime at 3,331 feet, where 7-inch casing was set, and had oil showing at 3,334 feet, total depth. Standard tools were being rigged up. It is an east offset to the Fairfield discovery well, producing from Lansing lime.

The Allon pool in Russell County was extended one-half mile southward at Vernon Oil & Gas Co. and G. A. Stearns No. 1 Olson, NE NW Section 27-14-14w. It had Lansing lime at 2,957 feet, total depth 2,998 feet, and made potential of 45 bbls. of oil daily. It is three-fourths mile west of the Gurney pool.

Wildcat Completions

Darby Petroleum Corp. No. 1-A Peavey, SE SE SW Section 13-11-18w, opened a producing area, already named the Peavy pool, in Ellis County, 1¼ miles southwest of the South Burnett pool. It had Arbuckle lime at 3,396-3,411 feet, total depth, was acidized, pumped 758 bbls. of oil in eight hours and made daily potential of 2,275 bbls. It is a northwest offset to the same operator's No. 1-C Peavey which found production last fall but was never completed.

Amerada Petroleum Corp. No. 1 Kruckenberg, C NE NE Section 14-19-15w, opened a pool northwest of Great Bend in western Barton County. It found Arbuckle lime at 3,575-95 feet, was bottomed at 3,632 feet and plugged back to base of the lime. After acidizing with 3,000 gallons, it pumped 44 bbls. of oil in eight hours and made potential of 132 bbls. of oil, with some water. Location is 3½ miles southeast of the Otis pool and 4 miles northwest of the Heizer pool. It is on a 9,000-acre block held by the Amerada corporation.

Sinclair Prairie Oil Co. No. 1 Pichner, NE SE SE Section 10-16-11w, Barton County wildcat, topped Arbuckle lime at 3,344 feet, total depth 3,371 feet, and 525 feet of fluid, of which 50 per cent was heavy black oil, rose in the hole. It was abandoned.

Duwe & Farris No. 1 Kimminau, NE NW SW Section 12-30-9w, wildcat that once was considered a likely pool opener in Kingman County, was dry and abandoned at 4,799 feet, total depth, with no oil or gas showing at that level. It had Simpson sand at 4,635 feet, Simpson shale at 4,691 feet and Arbuckle lime at 4,758 feet. Gas found at 4,265-95 feet gauged 100,000 cu. ft. and a showing of gas was found at 4,768 feet.

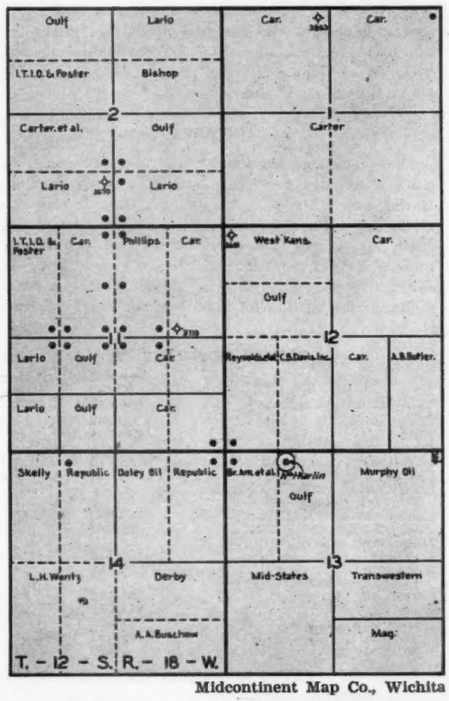
Higgens & Pearce No. 1-A Shrieves, NE NW SE Section 22-26-4, wildcat in Butler County, was dry and abandoned at 1,000 feet, total depth.

Lanahan Drilling Co. No. 1 Lagree, SE cor. Section 4-23-3w, Harvey County wildcat, was shut down and temporarily abandoned at 280 feet.

Ellis County

A large producer was completed in the Bemis field, Ellis County, at Cities Service Oil Co. No. 1 McCord, NW NW NE Section 26-11-17w. It made 24-hour potential of 3,500 bbls. of oil, pumping from Arbuckle lime found at 3,477-87 feet, total depth.

The second producer in the South Bemis pool was completed at Cities Service Oil Co. No. 1-E Hall, SW SW SE Section 35-11-17w. It found Arbuckle lime at 3,586-3,606 feet, total depth, pumped 34 bbls. of oil in eight hours and made potential of 104 bbls.



Midcontinent Map Co., Wichita

The Walters pool in Ellis County was extended one-fourth mile eastward at Gulf Oil Corp. No. 1 Karlin, Section 13-12-18w, in the south line of producers

Gulf Oil Corp. extended the Walters pool one-fourth mile eastward at No. 1 Karlin, NW NE NW Section 13-12-18w, in the south line of producers. It pumped 582 bbls. of oil in eight hours and made potential of 1,746 bbls. Production was from Arbuckle lime drilled at 3,691-97 feet, total depth.

Russell County

Texon Oil Co. No. 1 Hall, NW NW SE Section 26-14-13w, Letsch pool, Russell County, had Lansing lime at 2,825-72 feet, total depth, pumped 618 bbls. of oil in eight hours and made potential of 1,855 bbls. daily.

Same company's No. 1 Lipprand, NW NE NW Section 35-14-13w, topped Lansing lime at 2,845 feet, total depth 2,869 feet, pumped 638 bbls. of oil in eight hours and was rated potentially at 1,915 bbls. daily.

Crown Petroleum Co. No. 2 Krug, NW cor. Section 26-14-14w, Gurney pool, was acidized with 10,000 gallons, pumped 199 bbls. of oil in eight hours and made daily potential of 597 bbls. It had Lansing lime at 2,967 feet, was bottomed at 3,250 feet and plugged back to 3,028 feet.

Western Kansas Oil & Refining Co. No. 2 Schneider, SE NE NW Section 35-15-14w, Schneider area, drilled Arbuckle lime at 3,344-49 feet, total depth, pumped 649 bbls. of oil in eight hours and made potential of 1,950 bbls.

Estimated Daily Production

Estimated daily production for Kansas for the week ending February 18, and for the preceding week, was as follows:

	Barrels	
	Feb. 18	Feb. 11
Oxford City	950	925
Burrton	8,725	8,725
Ritz-Canton	4,100	4,075
Graber	3,125	2,700
Hollow-Nikkel	1,725	1,750
Lerado	750	750
Voshell	1,950	1,925
Wellington	2,075	2,050
Ellsworth County:		
Lorraine	1,850	1,750
Other pools	1,735	1,015
Rice-Barton counties:		
Bloomer	1,900	1,250
Chase	4,700	3,850
Geneseo	3,900	3,825
Raymond	875	775
Silica	9,725	7,600
South Silica	1,800	1,600
Keesling	500	550
Miscellaneous Rice	9,155	8,015
Miscellaneous Barton	7,405	6,960
Wherry	3,650	3,150
Russell County	22,375	20,875
Sedgwick County	3,625	3,450
Ellis:		
Bemis	4,750	5,175
Miscellaneous	3,135	3,965
Kingman County	620	685
Stafford County	5,235	4,790
Greenwood County	9,200	9,175
Butler County	19,450	19,125
Other fields	13,440	14,131
Total Kansas	152,425	144,600

Rice County

Continental Oil Co. No. 9 Wood, NW SE SE Section 12-18-8w, Geneseo field, Rice County, pumped 847 bbls. of oil in eight hours after acidizing and made 24-hour potential of 2,542 bbls. Production was from Arbuckle lime at 3,193-3,224 feet, total depth.

Phillips Petroleum Co. No. 3 Bolton, SW NW NE Section 31-18-7w, found Arbuckle lime at 3,204-06 feet, total depth, was acidized with 500 gallons, pumped 704 bbls. of oil in eight hours and gained daily potential rating of 2,112 bbls.

Barton County

Deiter Oil Co. No. 1 Putnam, NE SE SW Section 3-17-13w, Ainsworth area, Barton County, entered Arbuckle lime at 3,372 feet and drilled it to 3,378 feet, total depth. It pumped 223 bbls. of oil in eight hours and made potential of 669 bbls.

Gulf Oil Corp. No. 5 Nicholas, NW SE NW Section 12-20-11w, Barton County side of the Silica field, had nothing showing in Arbuckle lime at 3,342-47 feet, total depth, and was temporarily abandoned.

Stafford County

Stanolind Oil & Gas Co. No. 4 Fuller, C W half SE SW Section 11-24-11w, Zenith field, Stafford County, had basal Kinderhook pay at 3,755-73 feet, total depth 3,774 feet, flowed 136 bbls. of oil in four hours and made daily potential of 1,062 bbls.

(Continued on Page 152)

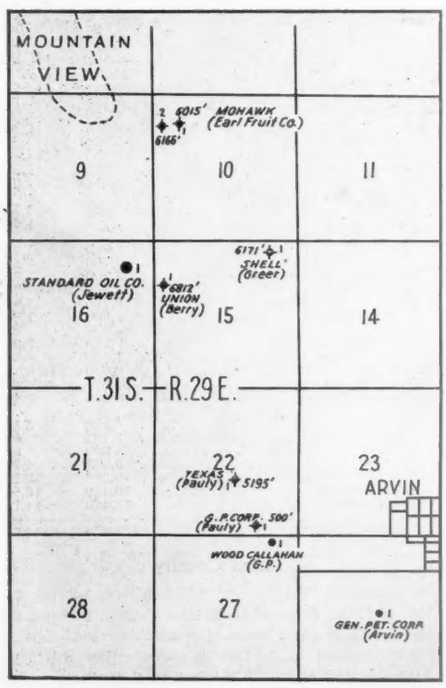
California Field Report

By
L. P. STOCKMAN

Mountain View District May Develop a New Oil-Gas Area

LOS ANGELES, CALIF., Feb. 20.—Standard Oil Co., drilling a joint wildcat with Superior Oil Co. and the Texas Co., appears to have found a new oil and gas field in Section 16-31-29, about 1 mile south of the most southeasterly tip of the Mountain View field of Kern County. This well, No. 1 Jewett, is 990 feet south and 990 feet west of the NE cor. (C SW NE NE) of Section 16-31-29, and is bottomed in the Chanac of the Kern River series of Pliocene age at 6,274 feet.

On a formation test, the valve was open for 61 minutes. Gas rose to the surface in three minutes with oil appearing 15 minutes later. The well was allowed to flow through the tester for one hour during which time it indicated a probable flow of 500



Standard Oil Co., Superior Oil Co., and the Texas Co. test southeast of the Mountain View field of Kern County flowed at the rate of 500 bbls. of crude oil and 2,500,000 cu. ft. of natural gas per day from 6,274 feet

bbls. of 31.1-gravity oil and about 2,500,000 cu. ft. of gas per day. As soon as the packer was pulled loose the crew began making preparations to run in a string of 8⅝-inch casing preliminary to an early production test.

The oil sand, which responded favorably to the formation test, was cored at 6,062-74 feet, with the bit still in the pay when the test was made. No. 1 Jewett is about 1,250 feet northwest of Union Oil Co. No. 1 Berry, which was drilled to 6,812 feet and abandoned due to the inability to develop clean commercial production. General Petroleum Corp. completed two small wells in the Arvin district about 2 miles southeast of Standard No. 1 Jewett and Texas Co. drilled a dry hole on the Pauley lease in Section 22-31-29, and abandoned work at 5,195 feet. The record of wells drilled in that area tends to indicate a possible monoclinal accumulation against the Mountain View fault which extends in a southeasterly direction through the Mountain View field and down into the Arvin district. Production activities of various operators in the Mountain View, Edison and Arvin fields indicate that the new area will be of secondary importance from a production standpoint if previous results in the general area are a criterion. The Mountain View field which has been headed toward a lower level for more than a year has only produced 32,659,510 bbls. of crude oil up to the close of 1938. The maximum at most should not exceed 50,000,000 bbls. which means that the recovery will not exceed 25,000 bbls. per acre. The Edison field had only produced 5,817,508 bbls. of crude oil up to the close of 1938, or less than 5,000 bbls. per acre, with future production estimated at not over 2,500,000 bbls. The relatively small production of these two fields is of special importance because the productive interval in the new area discovered by Standard, Superior and Texas is the same as that found productive in the Mountain View and Edison fields.

Torrance

The Eshelman section of the Torrance field contributed five or six oil wells completed in the Torrance-Harbor City district of Los Angeles Basin in the past week. All five new wells were located between 236th and 238th street and Eshelman Street and showed initials ranging from 220 bbls. per day to 1,390 bbls. daily. The largest well was Maldum Oil Co. No. 5 Lomita, finished flowing 1,390 bbls. of relatively clean 26.3-gravity oil per day from 5,165 feet through a 42/64-inch bean. This is the largest flowing well completed in the Torrance field in several months and at last reports production was holding up satisfactorily. This new well was finished with a 7-inch water string landed at 4,924 feet and 262 feet of 5¾-inch liner inciuding 245 feet of perforated. No. 1 Grant of J. T. Anderson and associates, at 237th and Eshelman streets, has been completed flowing 510 bbls. of clean 26.5-gravity oil per day through a 50/64-inch bean from 5,170 feet. This well was finished with a 7-inch water string cemented at 4,800 feet and 394 feet of 5½-inch liner including 368 feet of perforated.

The Eshelman section of the Torrance field in the eastern end of the Lomita section has yielded a number of excellent flowing wells during the past several weeks and appears to be the only section of the field in recent months to show a sustained production. In the older Lomita section where the deep zone was found last year new wells have shown declines as high as 40 per cent in the first few weeks and then show a further substantial drop with the result that many of these new and deepened wells may never pay out. This same condition has prevailed in the Harbor City district although in recent months new wells have even failed to show good production when finished. The Eshelman area located around 236th, 237th and 238th and Eshelman streets has shown the ability to show sustained production. The practice of operators undoubtedly has had a decided influence on the area's performance as most all operators have severely beaned in wells immediately sub-

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

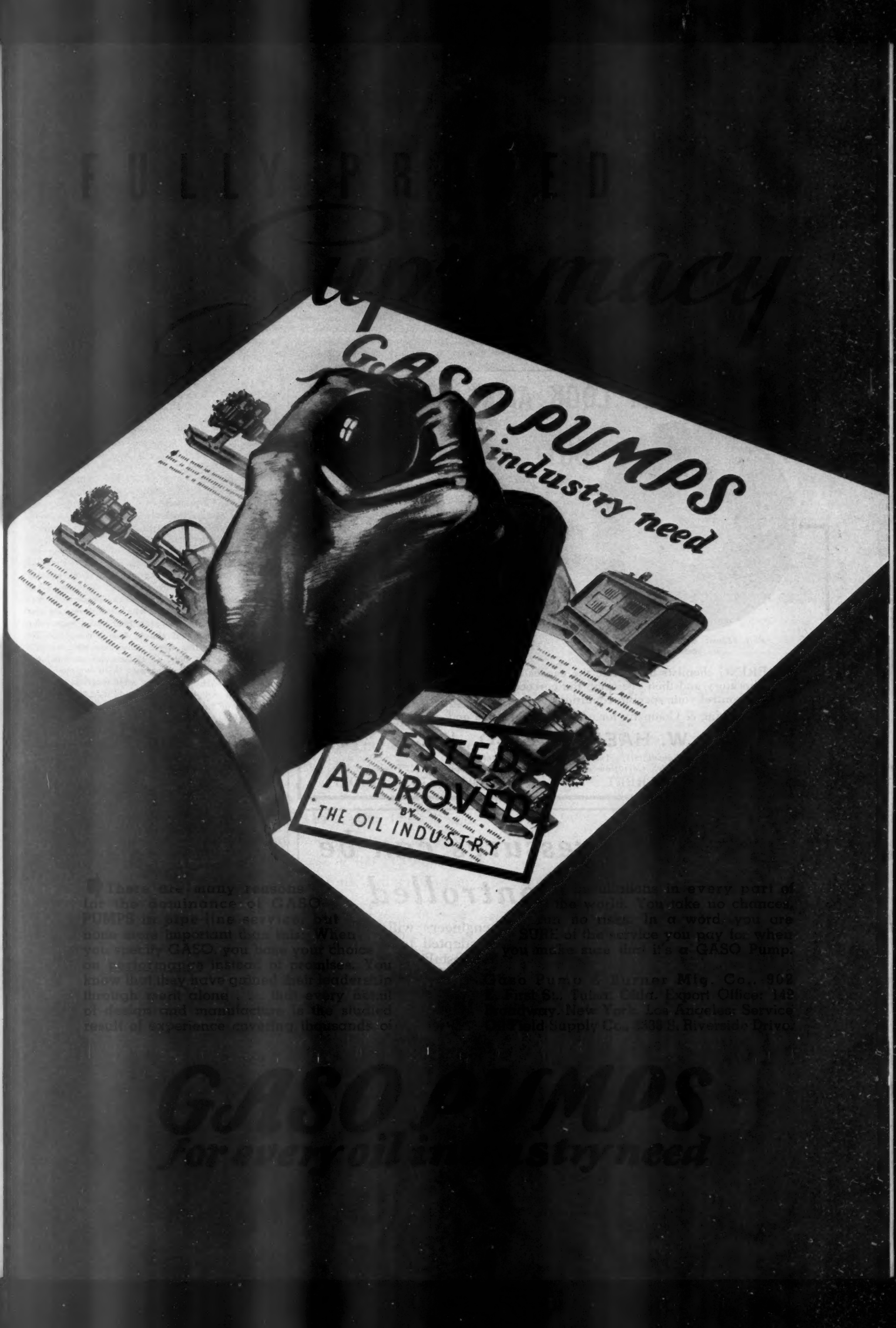
	February 11		February 4			
Intercoastal-domestic—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	60,642	8,663	.....	.....	60,642	.....
Fuel oil	130,894	18,699	70,385	10,055	263,259	.....
Diesel and gas oil	.....	.....	.....	.....	163,501	.....
Gasoline	66,715	9,531	.....	.....	66,715	344,116
Kerosene	56,940	8,134	.....	.....	56,940	59,885
Lubricants	.....	.....	.....	.....	37,621	.....
Foreign exports—						
Crude oil	485,395	69,342	583,989	83,427	1,620,228	2,180,626
Fuel oil	27,647	3,950	117,630	16,804	925,483	558,581
Diesel and gas oil	.....	.....	71,427	10,204	461,799	432,985
Gasoline	100,712	14,387	275,179	39,311	839,864	793,572
Kerosene	29,580	4,226	34,224	4,889	154,143	147,775
Coastwise-domestic—						
Crude oil	151,116	21,588	53,644	7,663	862,980	1,003,202
Fuel oil	164,526	23,504	136,366	19,481	1,039,483	1,677,742
Diesel and gas oil	51,510	7,359	51,973	7,425	352,294	200,425
Gasoline	406,047	58,007	165,077	23,582	1,455,173	1,692,858
Kerosene	7,289	1,041	16,437	2,348	33,668	28,854

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic—						
Diesel and gas oil	.....	.....	69,550	9,936	69,550	178,662
Lubricants	.....	.....	.....	.....	4,170	.....
Foreign exports—						
Crude oil	.....	.....	162,724	23,246	488,307	336,219
Fuel oil	.....	.....	81,591	11,656	197,240	52,685
Diesel and gas oil	.....	.....	29,204	4,172	64,649	118,920
Gasoline	.....	.....	19,187	2,741	360,110	305,402
Kerosene	.....	.....	.....	.....	49,227	85,841
Lubricants	.....	.....	.....	.....	3,386	.....
Coastwise-domestic—						
Fuel oil	264,971	37,853	76,310	10,901	1,115,964	823,707
Diesel and gas oil	4,397	628	20,176	2,882	156,329	212,621
Gasoline	118,329	16,904	209,367	29,910	1,094,148	880,453
Kerosene	16,252	2,322	.....	.....	113,288	113,991

TOTAL TANKER SHIPMENTS FROM CALIFORNIA TO DOMESTIC AND FOREIGN PORTS

Crude oil	60,642	8,663	.....	.....	60,642	.....
Fuel oil	130,894	18,699	70,385	10,055	263,259	.....
Diesel and gas oil	.....	.....	69,550	9,936	233,051	178,662
Gasoline	66,715	9,531	.....	.....	66,715	344,116
Kerosene	56,940	8,134	.....	.....	56,940	59,885
Lubricants	.....	.....	.....	.....	41,791	.....
Foreign exports—						
Crude oil	485,395	69,342	746,713	106,673	2,108,535	2,516,845
Fuel oil	27,647	3,950	199,221	28,460	1,122,723	611,266
Diesel and gas oil	.....	.....	100,631	14,376	526,448	551,905
Gasoline	100,712	14,387	294,366	42,052	1,199,974	1,098,974
Kerosene	29,580	4,226	34,224	4,889	203,370	233,616
Lubricants	.....	.....	.....	.....	3,386	.....
Coastwise-domestic—						
Crude oil	151,116	21,588	53,644	7,663	862,980	1,003,202
Fuel oil	429,497	61,357	212,676	30,382	2,155,447	2,501,449
Diesel and gas oil	55,907	7,987	72,149	10,307	508,623	413,046
Gasoline	524,376	74,911	374,444	53,492	2,549,321	2,573,311
Kerosene	23,541	3,363	16,437	2,348	146,956	142,845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sequent to completion. In no other section of the Torrance field have operators followed out such a consistent practice and the present rate of production has reflected this constructive work.

Alford Oil Co. No. 12 Lomita at 238th Street and Eshelman has been completed flowing 220 bbls. of 25.8-gravity oil per day from 5,179 feet. The hole was finished with a 7-inch water string landed at 4,896 feet and a 5½-inch liner. Cuba Oil Co. completed its first producer in the Lomita section of the Torrance field this week when No. 1 Extension at 236th Street and Eshelman was brought in flowing 446 bbls. of 25.9-gravity oil per day through a 38/64-inch bean from 5,164 feet. Early in the week Ray Wilson completed No. 2 Lomita flowing 420 bbls. of 26.2-gravity oil per day through a 31/64-inch bean from 5,155 feet and subsequently reduced the bean to 24/64-inch. In the Harbor City area, south of the Lomita section of the Torrance field, Texas Co. completed No. 3 Oakley flowing 232 bbls. of 26.5-gravity oil cutting 3 per cent with bottom of the hole at 5,188 feet. This well has a 7-inch water string landed and cemented at 5,018 feet and was finished with a 5½-inch liner.

The action of operators in the Eshelman section of the Torrance field in maintaining a good back pressure on producing wells has been reflected on field production during the past several weeks. For almost a year during the early stages of development in the old Lomita section of the field production decline about offset the amount of new production added by new wells with the result that the field's output remained relatively stationary. Reflecting the use of small beans by operators in the Eshelman area, production of the field has shown a consistent increase during the past several weeks. On December 17 production averaged 14,567 bbls. per day from 196 wells but then dropped to 14,498 bbls. on December 30 from 204 producing wells. Eshelman area wells began coming in early in January, 1939, with the result that two weeks later production had increased to 16,714 bbls. per day on January 20 from 215 wells and reached 17,104 bbls. per day on February 12. This increase is due primarily to consistent completions in the Eshelman area and to the use of good production practices. During the past several weeks some evidence of a possible fault running in a southwest direction between Kovell Oil Co. No. 1 Deep Hole, a recent completion, and the 236th and Eshelman area has been manifested but no actual data have yet been determined. Kovell Oil Co. No. 1 Deep Hole, incidentally, is located at 240th and Walnut streets a few blocks removed from the center of activity in the Eshelman area. During the current week, W. E. McCaslin cored almost 2 feet of vertically fractured shale at 5,166-68 feet which tends to indicate the existence of a faulted condition. Other evidence of possible faulting was noted in J. E. Pettijohn No. 1 Marilou at 238th and Eshelman streets and also in another well at 237th and Walnut streets. Existing subsurface conditions should be definitely determined within another few weeks as a result of development now under way.

Wilmington

Three new wells and one recompletion were finished in the Wilmington field of Los Angeles Basin. No. 3-W of George F. Getty, Inc., was returned to production doing 195 bbls. of 29.2-gravity oil cutting 12 per cent on a compressor. This well, a former upper zone producer, was deepened to the Ford zone at 5,690 feet. Union Pacific Railroad Co. No. 99, completed at 3,535 feet in the Ranger zone, was good for 270 bbls. of 18.8-gravity oil per day. This well was brought in flowing through a 40/64-inch bean and showed a tubing pressure of 650 pounds and a casing pressure of 850 pounds indicating that the initial daily production only represented a small part of the well's potentiality. Union Pacific Railroad Co. No. 13-E has been completed flowing 120 bbls. of clean 21.3-gravity oil per day from 2,999 feet after the hole had been finished with a 7-inch string landed at 2,761 feet and 444 feet of 4¾-inch liner including 422 feet of perforated. No. 13-E was gravel packed previous to completion. Richfield Oil Corp., which has developed good production in the Wilmington field under supervision of Frank Morgan and Harold Hoots, completed No. 23 Pacific Dock this week. This new well was finished flowing 346 bbls. of 18.2-gravity oil cutting 3 per cent from the Ranger zone with bottom of the hole at 3,015 feet. This new well was finished with an 8⅝-inch water string landed at 2,722 feet and was brought in flowing through a 14/64-inch bean which obviously reduced production.

Montebello

In the Montebello extension, Olympic Refining Co. completed No. 1 Smith Community flowing 980 bbls. of 35.2-gravity oil cutting 2 per cent from 7,132 feet. This new well was finished with 538 feet of 6⅝-inch liner with the bottom 105 feet perforated and was cemented through perforations at 7,020 feet. The 8⅝-inch water string is landed and cemented at 6,639 feet. This is the first well completed in the seventh zone in the town lot extension with the possible exception of Hathaway Oil Co. No. 1 Dore which is in the extreme southwestern end of the field. No. 1 Smith Community is of particular interest because if it is allowed to produce it will throw open the entire field to seventh zone development. Operators have been attempting to secure unanimous approval of a plan that would restrict development of the seventh zone for a period of one year but the present outlook is not any too favorable. If Olympic Refining Co. kills the flow of No. 1 Smith Community and plugs back to the lower finger of the sixth zone it will delay deeper drilling.

Union Oil Co. has a well drilled into the seventh zone but has announced that it will not produce from the seventh zone at present. This well is No. 1 Calkins and another production test of the production possibilities of the lower finger of the sixth zone will be made within the next few days. On a preliminary production test, the well tested wet which necessitated a recement job. Pongratz Oil Co. expected to complete an excellent producing well in the Montebello field within the next week as its No. 1 Newmark on a formation test in the Masser or sixth zone flowed at the rate of 2,000 bbls. of clean 26.2-gravity oil per day for a short period. This well, which logged top of the Masser zone at 6,665 feet and is bottomed at 6,710 feet, was killed within a short time; plans were made to run in and cement a string of casing. McVicar & Rood who are deepening No. 1 Manz, a former upper zone producer, logged the Masser zone in this

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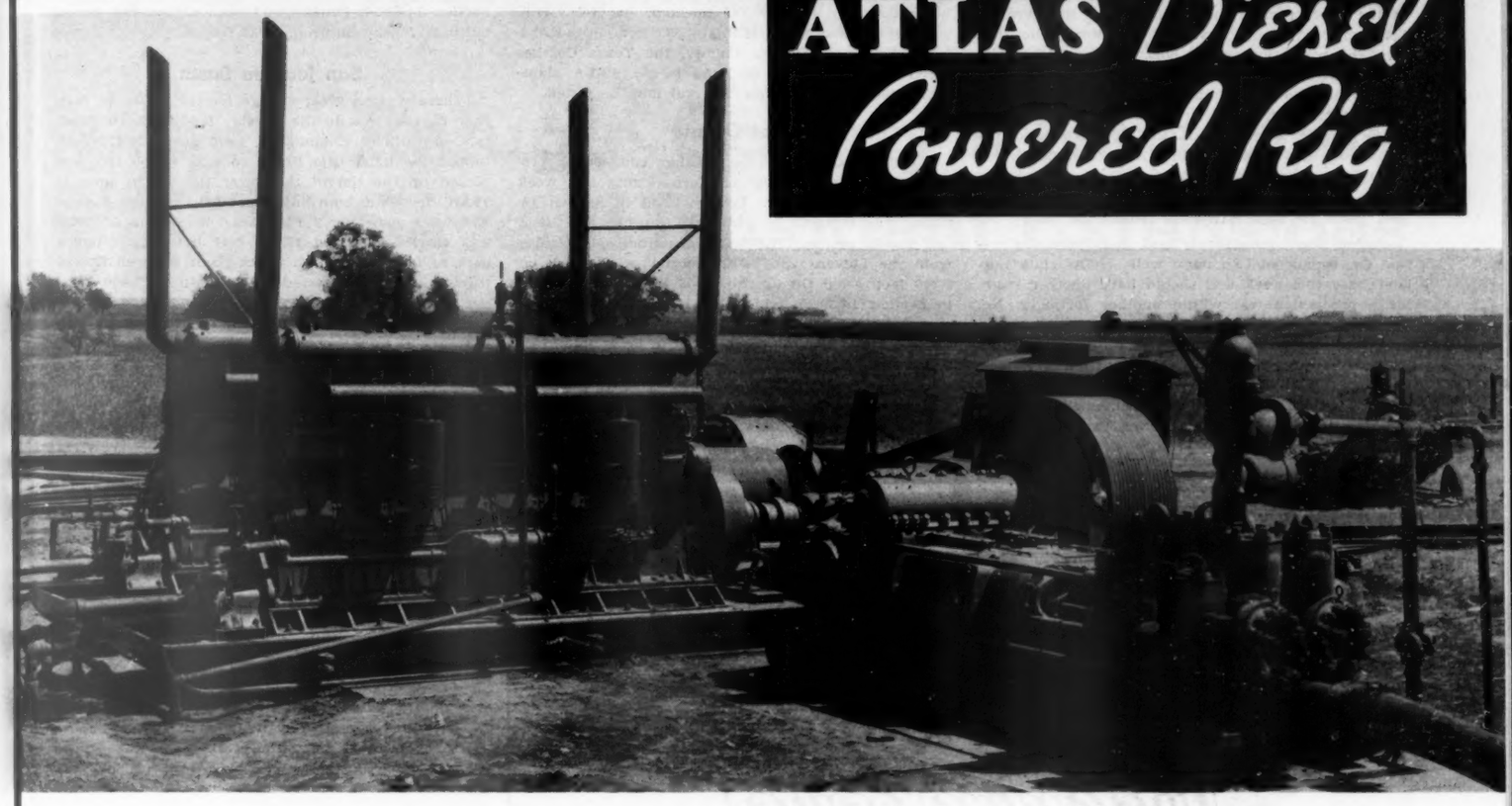
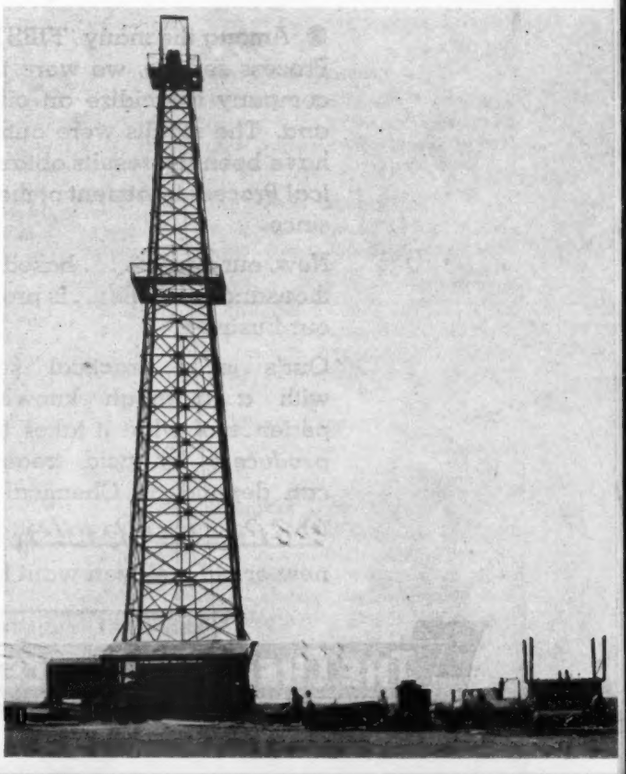


The Atlas Diesel Electrical Mechanical rig shown here is a "side by side" outfit, owned and operated by the Wasteka Oil and Drilling Company, of Oklahoma City. In this arrangement one Atlas Diesel drives the mud pump while the other drives the generator which supplies current to the drilling motor.

The engines are 8 cylinder 275 H.P. Atlas Diesels and the Allis-Chalmers electrical equipment consists of a 330 K.W. generator with 15 K.W. exciter. A 400 H.P. drilling motor and direct connected 11 H.C. Falk reduction gear unit are mounted on a common steel base.

The sheave on the engine driving the mud pump is a friction clutch sheave which can be disengaged, allowing both engines to be compounded for operating the generator when bringing a heavy load of pipe out of the hole. This rig has been making some enviable records in deep hole drilling which the owners would gladly detail to prospective producers.



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ATLAS IMPERIAL

well a few days ago at 6,655-6,708 feet and have since logged another sand body at 6,916-45 feet which may be the upper part of the seventh zone. Standard Oil Co. completed No. 4 Braun in the Montebello field early this week flowing 970 bbls. of clean 36.2-gravity oil and 600,000 feet of natural gas per day from the fourth finger of the sixth zone with bottom of the hole at 6,727 feet. No. 4 Braun was finished with an 8⅝-inch water string landed at 6,644 feet and 128 feet of 6⅝-inch liner including 76 feet of perforated and 6,593 feet of 3-inch tubing.

Los Angeles Basin

In the Huntington Beach field, Southwest Exploration Co. completed two more wells on its state tideland lease this week and should have another ready for a production test within another fortnight. No. 7 was completed pumping 270 bbls. of clean 25.9-gravity oil per day from 4,315 feet and No. 14 pumping 402 bbls. of clean 26.3-gravity oil daily from 5,140 feet. Both of these wells are bottomed beneath the Huntington Beach tidelands as a result of directional drilling. Wilshire Oil Co., which is redrilling two former producing wells, should have both ready for production tests within another week. These wells, which are being bottomed beneath the tideland, are No. 2 H.B. at 4,329 feet and No. 15 H.B. at 4,362 feet. In the Anaheim district of Orange County, the Texas Co. has cored some promising oil sand in No. 13-1-A above 8,250 feet where a 25-foot interval may be tested.

Kern County

Shell Oil Co. completed another commercial producer in the Canal field of Kern County this week when No. 61-14-A Kern County Land in Section 14-30-25, was brought in flowing 1,070 bbls. of clean 36.7-gravity oil and 790,000 feet of natural gas per day from the Stevens zone with bottom of the hole at 8,340 feet. Ohio Oil Co. No. 10-E Kern County Land in Section 14-30-25, which came in wet a week or so ago from 8,325 feet has been killed and surveyed. This indicated the source of water to be at 8,132 feet which is about 20 feet below the shoe of the 7-inch water string landed at 8,112 feet. This is purely a mechanical condition and should be remedied within another week or 10 days. In the Buena Vista Hills section of the Midway-Sunset field of Kern County, Honolulu Oil Corp. has completed well No. 5-A in Section 14-32-24, pumping 55 bbls. of 26.2-gravity oil cutting 17 per cent from 3,024 feet.

San Joaquin Basin

There was no great change for the better in deep zone development in the Greeley field of Kern County. No. 1 Elrich Community, total depth 11,655 feet, topped the upper Rio Bravo zone at 11,550 feet and picked up the top of the lower Rio Bravo zone at 11,570 feet but both intervals contained gray sand and were wet. No. 2 Fleishauer in Section 20-29-26, was carried down to 11,900 feet but then plugged back to 11,590 feet from which point the well flowed through formation tester at the rate of 1,400 bbls. per day cutting 65 per cent. No. 11-17 Kern County Land in Section 18-29-26, found the Stevens or Greeley zone wet at 8,088 feet and drilling operations are continuing. Late reports this week indicate that No. 1 Elrich in Section 20-29-26, had reached a depth of 11,825 feet with no further favorable indications below the Rio Bravo zone. In the Shafter district of Kern County, Union Oil Co. has started derrick construction for No. 1-36 Kern County Land, a wildcat which the company will drill with Continental Oil Co., Seaboard Oil Co. and Tide Water Associated Oil Co. This wildcat is in Section 36-27-24, about 4 miles southeast of the Wasco field of Kern County, which was discovered by Continental Oil Co. when a productive zone was found at 13,000 feet and another at 15,000 feet. Union's new joint wildcat is also about 6,500 feet southeast of Seaboard Oil Co.'s deep test, No. 1-C Kern County Land, which was carried down to 13,064 feet without success. Seaboard Oil Co.'s abandoned wildcat, No. 1-C Kern County Land, was about 1½ miles east of Main Oil Co.'s wildcat which blew out a number of years ago and destroyed the derrick and equipment. This places Union's new wildcat about 2 miles southeast of Main Oil Co.'s two wildcats and about the same distance northwest of Elmer Oil Co. No. 1 Shafter which was abandoned at 6,067 feet. In the Grapevine-Tejon district of Kern County and in the extreme southern end of the San Joaquin basin, the Petrol Corp. has cored through 1,022 feet of basalt-igneous flow in well No. 33-5 Reserve in Section 33-11-19, down to 8,060 feet. Some oil and gas showings have been logged within the last 200 feet in fractured basalt and it is hoped that this intrusion will be drilled through shortly. It takes a lot of confidence to drill through 1,000 feet of basaltic-igneous rocks to which oil is foreign in the hope that the deposit might prove to be an abnormal intrusion overlying a productive zone. In the Coles Levee field of Kern County, discovered a few months ago by Ohio Oil Co., this company's No. 2-F Kern County Land in Section 10-31-25, is coring excellent oil sand at 9,247 feet and should be ready for an early production test. This zone was logged in No. 2-F at 9,155 feet which places the well about 60 feet higher structurally than Ohio No. 1-F Kern County Land, the discovery well which was completed November 11, 1938, flowing 720 bbls. of clean 44.5-gravity oil per day. No. 2-F Kern County Land is located about a quarter mile north of No. 1-F Kern County Land which indicates that the high point of the structure may possibly be still further north.

Ventura

In the Ventura Avenue field, Tide Water Oil Co. completed two excellent flowing wells this week, although one was a recompletion after having been redrilled and deepened. This well was No. 135 Lloyd completed flowing 845 bbls. of 29.8-gravity oil cutting 5 per cent and 900,000 cu. ft. of natural gas per day from the 57 zone with bottom of the hole at 9,838 feet. The new well was No. 128 Lloyd completed flowing 1,152 bbls. of 29.4-gravity oil cutting 3 per cent and 1,750,000 cu. ft. of natural gas per day from the 57 zone with bottom of the hole at 9,975 feet. No. 128 Lloyd was finished with 1,182 feet of 5⅞-inch liner including 1,123 feet of perforated landed at 9,963 feet while No. 135 Lloyd was finished with 358 feet of 4¾-inch liner including 296 feet of perforated and 8,930 feet of 3-inch tubing. In the Shiells Canyon district of Ventura County, El Rancho Oil Co. made a formation test on No. 2 Elkins, a semi-wildcat in Section 9-3-19, and with the valve open for 28 minutes recovered a strong blow of gas and 600 feet of clean 27.2-gravity oil. This well which is being drilled with butane equipment is at present going ahead in an oil sand and shale at 3,140 feet.

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Southwest Texas District

By
F. L. SINGLETON

Refugio County's New Pool; Several Important Extensions

CORPUS CHRISTI, Tex., Feb. 20.—The discovery of a pool in Refugio County and the completion of several important wells extending proven fields, featured developments in the Southwest Texas district the past week.

The Mellon Creek field, 2½ miles southwest of the prolific Tomoconnor field, and east of the Refugio townsite, Refugio County, was opened by Copano Oil Co. No. 1-C O'Connor which flowed 356 bbls. of 35-gravity oil daily through a three-sixteenths inch choke. Tubing pressure was 1,250 pounds and shut-in casing pressure 1,800 pounds. Sand and shale showing oil was cored at intervals at 5,854-76 feet, and the well was completed through perforated casing at 5,855-75 feet. Locations for two offsets were made by the company, No. 2-C O'Connor, 933 feet northeast, and No. 3-C O'Connor, 933 feet northwest. The field is located on the large O'Connor ranch in the Timothy Hoyt Survey.

A producing area was opened in the East Alice area, Jim Wells County, by Gravis & Doran No. 1 Frances Clark, 2½ miles southeast of production and in the Los Precenos grant. The well is flowing gas and distillate through an eighth-inch choke. Casing had been perforated at 5,138-42 feet. The hole is bottomed at 5,319 feet and the well was completed in the above horizon after testing salt water at 5,202-12 feet. One mile due east of this well, Tom Graham Oil Co. has started drilling No. 1 N. C. Adams.

In the same county and located 10 miles north of the town of Alice, H. H. Howell No. 1 W. T. Wright, Ross M. Bridges Survey, tested salt water with a slight show of oil at 6,644-48 feet, and the perforations have been squeezed off, preparatory to retesting. A small amount of 41-gravity oil was recovered on the first test and working pressure on the tubing and casing built up to 600 pounds and 900 pounds respectively.

Important Tests Show Water

Prospects of extending the Riverside field, Nueces County, were not encouraging as production tests on two important south outpost wells showed salt water. Heep Oil Corp. No. 1 Smith, 1½ miles south of production, showed salt water on three drill-stem tests at 5,043½-47 feet, 5,038-41½ feet and 5,031-33½ feet, and a fourth test was scheduled to be made over the week end. Approximately one-half mile north of this well, Republic Natural Gas Co. No. 1 Seaboard Oil Co. is plugging back to retest after two tests at 5,298-5,308 feet and 5,050-70 feet, showed nothing of importance. Interest in the field is now centered on H. D. & H., Inc. No. 1 Wright, a south offset to the discovery well which is drilling in shale below 4,748 feet, and Henshaw Brothers No. 1 Countiss, an outpost test, due west of the discovery that is drilling below 4,000 feet. Location of a west offset to the discovery was made by Shell Petroleum Corp. for No. 1 Griffin. Seaboard Oil Co. No. 2 Wilson, the first well to produce oil, flowed 81 bbls. in 24 hours, flowing through a 7/64-inch choke with tubing pressure 1,275 pounds and casing pressure 1,650 pounds.

In the active McCampbell field, Aransas and San Patricio counties, interest is centered on the outcome of a scheduled production test at R. B. Bryant No. 1 Morgan and others which is reported to have cemented casing to test the 7,100-foot sand. This well is the nearest test to the Aransas Pass townsite and the outcome will more or less determine if production will extend into the city limits where approximately 27 locations have been made. One and a half miles south of production, Richardson Petroleum Co. No. 1 Sherwood is drilling below 8,000 feet. Only a slight showing is reported to have been logged in the 6,800- and 7,000-foot horizons. Three producers were added to the field, and 23 active drilling operations are reported.

Development in the East White Point field, San Patricio County, continues to become widespread, as one new completion was reported and several wells were in the process of completion. Shasta Oil Co. No. 1 Teeter, Section 50, flowed 131 bbls. daily through a 7/64-inch choke, from sand at 5,613-73 feet. Plymouth Oil Co. No. 3 Ficke, topped oil sand at 5,613 feet and 7-inch casing was cemented on bottom. Humble Oil & Refining Co. No. 2 Speer, logged oil sand at 5,629-51 feet, and casing was cemented for completion. Shell Petroleum Corp. No. 2 Kirk was preparing to complete after having cemented casing on bottom at 5,673 feet.

In the newly opened Longhorn field, Duval County, Henderson Coquat No. 3 Miller defined production as the hole was abandoned at a total depth of 5,638 feet. Location is in Section 23. The same operator completed No. 2-B Miller for an initial production of 89 bbls. in 19 hours, flowing through an eighth-inch choke. The completion was made in sand at 4,033-38 feet.

Two completions were reported for the Kelsey field, Jim Hogg and Brooks counties. On the Brooks County side of the field, Humble Oil & Refining Co. No. 4 McGill Brothers extended production to the north as it flowed 97 bbls. in 12 hours through a three-sixteenths inch choke. Sand was topped at 4,699-4,725 feet, the total depth, and 5½-inch casing was cemented at 4,710 feet. On the west side of the field, and located in Jim Hogg County, the same company's No. 7 Bass cored oil sand at 4,704-31 feet, and is being completed as a gas well at a total depth of 4,734 feet. Locations were made for No. 5 McGill Brothers, 2,799 feet west of No. 1 McGill, and No. 8 Bass, 933 feet south of No. 2 Bass.

To the south and located in the Sun field, Starr County, Sun Oil Co. No. 1-B Montalvo defined production to the northeast when the hole was abandoned at a total depth of 5,296 feet. The well is located approximately 1 mile northeast of production in the Los Retachez grant.

Location for an interesting wildcat for the Ricon area, Starr County, was announced by the Transwestern Oil Co. for No. 1 W. I. Cameron in Section 228. The well is located about 2 miles north of the Rincon discovery well, a distillate producer and about 1 mile east of D. D. Oil Co. No. 1 Dallas Joint Stock Land Bank, which is testing through perforated casing at 4,280-84 feet, showing salt water and some oil.

In Brooks County, 2 miles south of the town of Falfurrias, Southern Minerals Corp. No. 1 Proctor has been abandoned after a series of production tests through perforated casing at 6,855-70 feet, 6,553-68 feet and 6,353-68 feet, showed nothing but salt water.

SOUTHWEST TEXAS COMPLETIONS IN PROVEN FIELDS

Aransas-San Patricio Counties

McCampbell field: Corgey and Grote No. 2 Nelson, total depth unknown, tight well, 210 bbls., three-sixteenths inch choke. J. P. Nash No. 1 Young & Henderson, perforated casing 7,117-23 feet, 192 bbls., three-sixteenths inch choke. Nueces Royalty Co. No. 1 J. N. Ammen, perforated casing 7,117½-20½ feet, 200 bbls., three-sixteenths inch choke. Rutherford Oil Corp. No. 4 McCampbell, perforated casing 7,134-42 feet, 109 bbls., eighth-inch choke.

Calhoun-Victoria Counties

Heyser field: Gulf Oil Corp. No. 17-B Traylor, sand 5,478-88 feet, 126 bbls., 3/32-inch choke.

Caldwell County

Branyon field: Coffield-Robinson No. 2-C Young, 2,225 feet, abandoned. Adams and others No. 5 Flowers, 2,354 feet, abandoned. Salt Flat field: Martel Petroleum Co. No. 7 Malone, 2,697 feet, 85 bbls. oil, plus 9 bbls. sulfur water, pumping. Walnut Creek field: Dr. C. H. Brownlee No. 1 fee, 1,680 feet, abandoned.

Duval County

Benavides field: Hiawatha Oil & Gas Co. No. 22 Parr, perforated casing 5,492½-96 feet, 118 bbls., 5/32-inch choke. Casa Blanca field: Magnolia Petroleum Co. No. 3 Duval County Ranch Co., sand 1,202-08 feet, 60 bbls., pumping. Driscoll field: Continental Oil Co. No. 32-A Driscoll, sand 3,363-70 feet, 149 bbls., quarter-inch choke. Fitzsimmons field: Key-States Drilling Co. No. 1 Fitzsimmons, 5,020 feet, abandoned. Hoffman field: Cuellar Brothers No. 1-A fee, sand 2,530-48 feet, 125 bbls., jetting. Cox, Hamon and others No. 55 Cuellar, sand 2,804-16 feet, 75 bbls., jetting. Rowan & Hope No. 6-B Cuellar Brothers, 2,800 feet, abandoned. Longhorn field: Hiawatha Oil & Gas Co. No. 7 Miller, perforated casing 4,914½-18 feet, 110 bbls., 5/32-inch choke. Lundell field: Humble Oil & Refining Co. No. 8-B White, sand 1,523-26 feet, 24 bbls., two hours, jetting.

Hidalgo County

Samfordyce field: Fohs Oil Co. No. 2-B Guerra, perforated casing 2,843-48 feet, 144 bbls., quarter-inch choke.

Jim Hogg County

Kelsey field: Humble Oil & Refining Co. No. 6 Bass, sand 4,710-28 feet, 32 bbls., 14 hours, quarter-inch choke. Humble Oil & Refining Co. No. 3 McGill Brothers, sand 4,723-26 feet, 137 bbls., 5/32-inch choke.

Jim Wells County

South Alice field: Tom Graham No. 1-B Bankers Mortgage, perforated casing 5,160-63 feet, 24 bbls., quarter-inch choke. Tom Graham No. 2-E Bankers Mortgage Co., perforated casing 5,336-40 feet, 90 bbls., 3/32-inch choke. Henshaw Brothers and others No. 1 Thigpen, perforated casing 5,352-56 feet, 165 bbls., eighth-inch choke. Lewis Production Co. No. 4 Sayers, perforated casing 5,197-5,213 feet, 114 bbls., eighth-inch choke.

Milam County

Rockdale field: W. A. Jones No. 1 Timmerman, 646 feet, abandoned.

Nueces County

Agua Dulce field: L. M. Lockhart, sand 4,782-4,809 feet, gas well. Clara Driscoll field: O. W. Killam No. 1 Moore, perforated casing 5,660-66 feet, 125 bbls., eighth-inch choke. West Saxet field: Carlos Oil Corp. No. 1 Blucher, perforated casing 3,648-52 feet, gas well.

Refugio County

La Rosa field: Coronado Corp. No. 7 Rooke, perforated casing 5,902-05 feet, 184 bbls., eighth-inch choke. Coronado Corp. No. 8 Rooke, perforated casing 6,320-23 feet, 185 bbls., eighth-inch choke. Hewitt & Dougherty No. 3 Rooke, perforated casing 6,315-25 feet, 173 bbls., eighth-inch choke. Refugio field: Houston Oil Co. No. 59 Rooke, perforated casing 6,410-15 feet, 157 bbls., eighth-inch choke. Tomoconnor field: Quintana Petroleum Corp. No. 30 Heard, perforated casing 5,858-66 feet, 845 bbls., quarter-inch choke. Quintana Petroleum Corp. No. 78-A O'Connor, perforated casing 5,901-07 feet, 650 bbls., quarter-inch choke.

San Patricio County

East White Point field: Houston Oil Co. No. 2

(Continued on Page 155)

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Among the Drilling

PARKER DRILLING CO. of Tulsa, and Fort Worth, Tex., has obtained farmouts on several half sections in Crane and Upton counties which will require the drilling of some 36 tests. On the Crane County side of the McCamey field, Texas Co. farmed out to Parker Drilling Co. a total of 120 acres. The deal requires the drilling of two tests, one of which has already been started. Texas Co. will receive a one-sixth override and rights below 2,750 feet. The tract is in the north quarter of Section 22, Block 35, H.&T.C. Survey, and is a southwest offset to Sindorf & Stone production. In Upton County the drilling company acquired several half sections in the C.C.S.D.&R.G.N.G. Survey with Texas Co. retaining 10 acres around each of its 11 producing wells on the tract. Parker Drilling Co. is obligated to drill four tests, and to keep two strings of tools running until 30 more are drilled. Texas Co. reserves all rights below 2,750 feet, will receive one-sixteenth override on all wells with daily allowables of 10 bbls. or less each, a three thirty-seconds override on all wells with daily allowables of between 10 and 20 bbls. each and a one-eighth override on all wells with a daily allowable exceeding 20 bbls.

GROOVER & ROSE, Albany, Tex., contractors, were rigging up spudder for Jones & Stasney No. 1 Ida Crow, Jones County, West Central Texas wildcat, nearly 2 miles west of the new Griffin pool. The test will be 990 feet from the south and 330 feet from the east lines of the southwest quarter of Section 9, D.&D.A. Survey, in an area which has shown oil in two previous tests.

F. C. GREEN, North Texas contractor, has agreed to drill a wildcat test in Baylor County for Consolidated Oil Co. of Wichita Falls. The test will be near the new Canyon sand area opened by British American Oil Co. about 10 miles east of Seymour. Consolidated Oil Co. has contracted a test to the Canyon sand at about 2,650 feet. Location is in Section 230, T.& N.O. Survey, on a block of 640 acres, more than 3 miles southeast of the discovery well in Section 215. Contractor plans to move in tools and spud at once.

CHARLES HART, contractor of Gainesville, Tex., will drill a wildcat test in Montague County, North Texas, for Staley Oil Co. of Wichita Falls. Field men for Staley Oil Co. were in Montague County last week checking a block of 5,000 acres which the company has acquired south and southwest of the town of Montague and are preparing to stake the location this week. In agreement with Hart who blocked the acreage, a lower Strawn sand test is to be started by the end of February. The area is near the deep discovery by Rogers & Rogers which, with its completion last month, brought the county a leasing boom.

EVERTS DRILLING CO., Dallas, Tex., was moving in material for its No. 1 J. H. Vick and others, a proposed 2,500-foot cable-tool wildcat test 330 feet from most easterly south and east lines of the J. D. Smith Survey, Abstract 1638, in Jack County, West Central Texas. It is about 10 miles southwest of Bryson.

TED WEINER, New Mexico operator and contractor, has dug pits and is moving in materials for his No. 1 Lucille Clements, wildcat test in Chaves County, just across the line from Lea County, New Mexico. It is in the northwest corner of Section 27-10-30. Contract depth is 5,000 feet and it is on a block of 5,000 acres.

ROWAN DRILLING CO., Fort Worth, Tex., has spudded for a scheduled 5,500-foot wildcat test for Southern Cross Oil Co. on Upton & Upton ranch, 22 miles southeast of San Angelo, West Texas. When last reported the test had drilled to 70 feet in lime, making an 18-inch hole with cable tools. Diesel power is being used. Location is 850 feet from the south and 1,320 feet from the west lines of Section 20, Block A, J. H. Gibson Survey, on a block of more than 10,000 acres. J. R. Dougherty of Hobbs, N. Mex., is in charge of the wildcat for the drilling firm. Drillers on the test are F. E. Bucy, Tom Reynolds and B. R. Eppler, all of Eunice, N. Mex., and J. T. Klinger of Hobbs, N. Mex. Tool dressers are Raymond Croft of Fort Worth, John Wooliver of Eunice, W. R. High of Hobbs and W. I. Trembley of Tatum, N. Mex.

TRINITY DRILLERS, INC., received contract from Transwestern Oil Co. for No. 18 Duval County Ranch Co., a wildcat in the G.C.&S.F. Survey 294, Duval County.

RHODES DRILLING CO., Dallas, Tex., was preparing to move rotary rig from the Iron Mountain Oil Co. and Humble Oil & Refining Co. No. 3 J. T. Taylor to a new north outpost for the operators in the Griffin pool of Jones County, West Central Texas.

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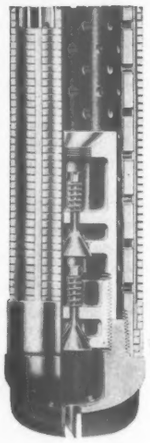
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Contractors

The new test will offset a test now being drilled by the Consolidated Oil Co. on the Mrs. J. A. McCaskey lands.

HOUSH & THOMPSON received contract from Windsor Oil Co. for a 6,500-foot test to be drilled a half mile north of the Tomoconnor field in Refugio County. The well is on the Jesse Power heirs lease in the Gideon Walker Survey. Derrick is up and the well will be spudded during the week.

L. A. NORDAN is starting two new operations offsetting the discovery well of the Mellon Creek field, Refugio. The discovery well was drilled for Copano Oil Co., of which Mr. Nordan is a member. The field is about 2½ miles southwest of the Tomoconnor field and east of the Refugio townsite in the Timothy Hoyt Survey. Sand was logged in the discovery well at 5,854-77 feet, and the oil was completed for an initial production of 356 bbls. of 35-gravity oil daily, flowing through a three-sixteenths inch choke.

WHEELER DRILLING CO. is moving in material to the Samfordyce field, Hidalgo County for Fohs Oil Co. No. 3-B Guerra in Porcion 40.

HARRY L. EDWARDS is preparing to start a wildcat in Lavaca County, which will be drilled by himself and others. The well is southwest of Vienna in the M. Wooten Survey, on the F. Roecher lease.

JACK FRAZIER received contract from Navarro Oil Co. and others for a wildcat to be drilled in the Hamshire area, Jefferson County. The well is to be drilled on the Welch lease in the E. Lopez Survey, and the hole will be carried to the Frio formation, below 7,000 feet.

COOPER DRILLING CO. No. 5 School Land, SE NE NE of Section 16-14-6, Lincoln County, Oklahoma, was drilled to a total depth of 3,090 feet; it flowed 628 bbls. of oil in 24 hours on the first test and 406 bbls. the second 24 hours.

CROSBY DRILLING CO is preparing to start drilling operation on the company's No. 1 Wilson, a wildcat in the A. G. Reynolds Survey, about 5 miles south of Algoa, in Brazoria County.

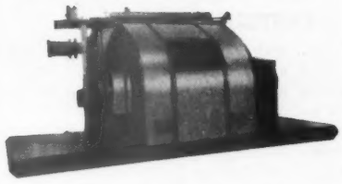
TABER & COLEMAN, Tulsa, at No. 1 Miller, SE SE SE of Section 29-7-5, Pottawatomie County, Oklahoma, set 7-inch casing at 4,070 feet in dolomite. After being drilled to a total depth of 4,135 feet it was acidized with 5,000 gallons; it swabbed 7 bbls. of oil and 25 bbls. of water per hour. A submerged centrifugal pump was installed after the well had been shut down for 24 hours; with the pump it made 225 bbls. and production has been increasing gradually.

Taber & Coleman and others, at No. 1 Wolfe, NW SE of Section 33-7-5, were drilling at 4,290 feet in dolomite and shale. It was dry in the dolomite and will be drilled to Wilcox to complete the contract. The Wilcox is expected at about 4,330 feet.

HELMERICH & PAYNE, Inc., Tulsa, No. 1 Bruno, SW SE SW of Section 31-7-5, Pottawatomie County, Oklahoma, topped Viola at 4,035 feet and drilled to a total depth of 4,205 feet. It was acidized with 5,000 gallons and pumped 700 bbls. of oil and 1,200 bbls. of water in 24 hours and was drilling at 4,230 feet.

COPIES of a petition started in Holdenville, Okla., by a group of oilfield drillers and helpers, to which a great number attached their signatures, have been sent to Governor Phillips, congressmen, etc., from that district, and the wage and hour administrator, Washington, D. C. The petitioners state that work in the oil fields "is very spasmodic to the extent that we do not average 40 hours a week in a year's time, working on an eight-hour-a-day basis. At least one-half of our work is too far from home to drive to and from work, which means hotel expenses in addition to the family expenses at home. It costs us just as much to work on a 40-hour-a-week basis as it does on a 56-hour-a-week basis. A car is a necessary equipment in our work, and operating expenses and hotel expenses are a business expense and we should be allowed to deduct the entire cost from our income-tax statement."

Properly named . . .



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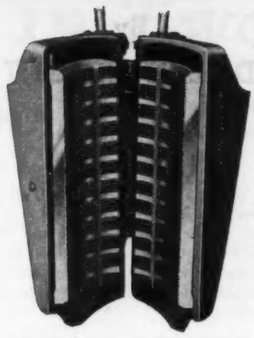

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North and East Texas

By
D. H. STORMONT

Extensive Wildcat Work and Deep Drilling Are Projected

WICHITA FALLS, Tex., Feb. 20.—The staking of three projected 4,300-foot tests in the north extension area of the Hull-Silk pool and the indication of production in the fourth well for the area, together with extensive wildcatting throughout the entire county, featured the week's activity in the North Texas district.

In what has become known as the north extension area of the Hull-Silk pool, Deep Oil Development Co. and Ligon & Burns have assured the area its fourth 4,300-foot producing well in their No. 1 Wilson, northwest corner of Section 25, A.T.N.C.L. Survey. The extension area lies about a mile northwest of the main body of the Hull-Silk field and is centered around the northwest corner of Section 25 and the southeast corner of Section 127, both in the A.T.N.C.L. Survey. The indicated new oil well is the west offset to Thurman and associates No. 1 Wilson, and was flowing at the rate of 40 bbls. of oil hourly through casing while cleaning out. Operators plan to run tubing and test. The total depth is 4,303 feet with the main sand body logged from 4,264 feet to the bottom.

As a south offset to this well, the same operators have staked No. 3 Willson. Two other locations were staked in the area, Nos. 2-E and 3-E Wilson, by Chapman & McFarland. The two locations are along the east line of Lot 1, Block 22, A.T.N.C.L. Survey.

Southeast offset to the Deep Oil Development and Ligon & Burns well, Chapman & McFarland No. 1-E Wilson, along the east line of the center portion of Lot 1, Block 22, was drilling plug from 5-inch liner set at 4,255 feet after drilling sand from 4,255-58 feet.

Wichita Falls Area

South offset to the Continental Oil Co. and Petroleum Producers Co. No. 1 State Asylum lands, which opened a small pool 3 miles south of Wichita Falls last summer, the same operators' No. 1 Albert Finkler, in the Green Reynolds Survey, flowed 395 bbls. of oil in 15½ hours after being acidized. The test was drilled several weeks ago and had not indicated commercial production. At the end of the 15½-hour period the well had settled down to a hourly flow of about 3 bbls. The discovery well for the area is a small producer making about 60 bbls. of oil per day.

Montague County

First official gauge on Montague County's first deep oil producer, which opened a new Strawn sand pool 1 mile west of the town of Nocona, has been reported by the Railroad Commission. Rogers & Rogers No. 1 J. E. A. Burnett, in the J. E. Lenow Survey, flowed 523.5 bbls. of oil in 24 hours, through half-inch tubing choke. The well was not reported making any water and it will be given the discovery-well allowable of 100 bbls. of oil per day along with the nexxt four wells to be completed on the tract. The Railroad Commission has set up temporary rules for the field which stipulate that wells shall be spaced 933 feet apart and 466 feet from the property line. The emergency ruling has been adopted until adequate information has been obtained for a hearing which is scheduled for March 6. "It appears that the producing structure covers the town of Nocona," was the reason for the ruling as stated in the commission order.

Wilbarger County

A new wildcat has been staked in the east central part of Wilbarger County. W. H. Rogers of Vernon has made location for his No. 1 A. P. Morris, a 3,100-foot rotary test staked in the southeast corner of Section 3, Block 14, H.&T.C. Survey. The wildcat is 2 miles west of the town of Harrold.

Baylor County

In Baylor County, three-fourths of a mile southwest of the Canyon sand discovery well, the British American Oil Producing Co. is coring below 2,540 feet in its No. 1 Cope, Section 220, T.&N.O. Survey, 9 miles east of Seymour. The operator started coring at 2,490 feet and will, even though commercial production is found in the discovery well horizon, core through it and drill on to the projected 5,500-foot contract depth. The discovery well is producing from the Canyon sand from 2,580 to 2,605 feet.

Clay County

New and deepest pool yet for Clay County has been indicated in the L. T. Burns No. 1 Browning, Block 94, J. Belcher Survey, 6 miles southwest of Blue Grove, in the southwest part of the county. In the lower part of the Strawn section, the wildcat, contracted to 5,500 feet, logged a section of oil sand from 4,445 to 4,465 feet, a section of 20 feet. Operator drilled the first 10 feet of sand, then cored 6 feet of it and drilled the remaining 4. The hole is being conditioned for a drill-stem test.

NORTH TEXAS COMPLETIONS

Archer County

P. C. Burns No. 1 Andrews, 917-26 feet, 100 bbls. Continental Oil Co. No. 3 A. J. De Moss, 967-81 feet, 90 bbls. S. H. Fagadau No. 1 Charles H. Thuman, 1,552 feet, dry. W. B. Omohundro No. 1 T. B. Wilson, 4,416 feet, dry. A. L. Rollins No. 1 W. Ford, abandoned location. Shappell Oil Co. No. 15 Grace Bell, 969-89 feet, 137 bbls.

Clay County

J. M. Corbett No. 1 E. L. Turner, 635 feet, dry. Le Fevre & Blakeley No. 1 Joint Land Bank, 1,465 feet, dry. W. H. Metzner No. 3 C. T. Taylor, 530 feet, dry. Metzner & Burns No. 14 J. J. Taylor, 1,087-1,112 feet, 175 bbls.

Cooke County

Schermerhorn Oil Co. No. 20 M. Kessler, 1,322-46 feet, 15 bbls.

Foard County

Texas Co. No. 16 L. K. Johnson, 3,530-3,651 feet, 631 bbls.

Jack County

H. M. Teba y Tr. No. 3 D. R. Sewell, 350 feet, dry; No. 4 D. R. Sewell, 305-12 feet, 2 bbls.

Montague County

Seitz & Comegys No. 8 J. W. King, 2,127-38 feet, 188 bbls.

Wichita County

M. Staniforth No. 1 Ed Reilly, 741-60 feet, 10 bbls. E. C. Oil Co. No. 4 J. F. Miller, 3,693-3,897 feet, 480 bbls. Fain & McGaha No. 6 E. P. Griffin B, 3,755-3,835 ft, 1,408 bbls. J. E. Farrell No. 30 J. L. Waggoner, 3,798-3,875 feet, 800 bbls. King Oil Co. No. 5 S. W. Wigley A, 3,768-3,870 feet, 528 bbls. Moran Brothers, Inc. No. 2 J. L. Waggoner D, 3,818-74 feet, 800 bbls. W. B. Omohundro No. 3-D J. R. Pace B, 3,655-3,814 feet, 760 bbls. Shell Petroleum Corp. No. 2-A M. E. Reilly, 1,859 feet, dry. Sunray Oil Co. No. 2 L. C. Denny, 3,806-85 feet, 768 bbls.

Wilbarger County

Humble Oil & Refining Co. No. 1 D. B. Barker, 2,993 feet, dry. Magnolia No. 41 W. R. Piper, 1,776-1,947 feet, 25 bbls.; No. 32 W. R. Piper, 1,789-1,880 feet, 80 bbls.

Young County

Brazelton Brothers No. 2 M. E. McBrayer, 693 feet, dry. Petroleum Production Co. No. 15 J. L. Boone, 520-32 feet, 10 bbls.

EASTERN TEXAS

DALLAS, Tex., Feb. 20.—Eastern Texas, which early in the year, appeared headed toward a slump in wildcat drilling activity, is rapidly picking up as important tests get started in Wood, Smith and Houston counties to indicate a program expected to bring several more tests.

George Strake is rigging up on his wildcat staked last week in the Frazier lands, J. Walker Survey, 4 miles east of Yantis in Wood County. R. W. Fair is rigging up material at his location staked on the Clark land, J. Lewis Survey, 2 miles west of Mount Sylvan, in Smith County. The area north of Grapeland in north Houston County is in line for more drilling with Shell and Cities Service holding expiring leases. In the northern part of East Texas, Grayson County received two new wildcat locations. John Grey staked No. 1 Freeman in the W. S. Reeves Survey, about 8 miles northwest of Denison and Ross & Marshall staked No. 1 J. N. Taylor in the W. Moore Survey, 7 miles northwest of Denison.

An Upshur County wildcat, Clark & Johnson No. 1 Parker, 7 miles northeast of Gilmer, was holding considerable interest in the area as operators drilling ahead below 3,590 feet in an unreported formation.

In Hill County, T. C. Brannon of Hillsboro and Corpus Christi and his associates are planning a new deep test for their block of acreage southeast of Hillsboro. The wildcat is expected to be carried to 4,500 feet and will be on the J. G. Weatherby tract in the W. C. Merriwether Survey.

Talco Field

Two extensions to Titus County's portion of the Talco field afforded considerable activity for the almost inactive field in northeastern Texas. Extending the eastern limits of the field three-quarters of a mile. Humble Oil & Refining Co. No. 1 T. G. Temple found 10 feet of saturation at 4,280-91 feet. Casing was cemented on top of the saturation and as the week closed operators were preparing to drill the plug.

On the south side of the field, Nathan Pipe & Supply Co. No. 1 Bates, in the Franklin County portion of the pool, is shut down for the erection of storage. The test has 2,800 feet of oil in the hole and is bottomed at 4,307 feet. At 4,300 feet the test pumped at the rate of 25 bbls. of oil daily.

About 5 miles north of the Talco pool, efforts are being made to get a deep test started on a 6,000-acre block assembled by O. L. Derrick and others. Plans call for a 6,000-foot or deeper test of the Trinity section. The block lies between Sulphur and Johntown.

Navarro Crossing

Moving outside of the Navarro Crossing field limits, Humble Oil & Refining Co. is building derrick for its new location staked in the Wesley Burns lands, John La Riviere Survey, Abstract 49. The test is about a mile south of Walter Goldston No. 1 Burns, a failure drilled to 5,898 feet in 1936. Rig is expected to be moved to this location upon completion of the operator's No. 1 Tryon, now drilling below 2,800 feet on the south side of the field.

EAST TEXAS COMPLETIONS

(One-hour tests)

Gregg County—Longview Area

Jim McMurry No. 7 Thad Snoddy, 3,561-90 feet, 60 bbls. Shell Petroleum Corp. No. 30 H. Hampton, 3,616-3,734 feet, 60 bbls.

(Continued on Page 155)

Texas and Louisiana Gulf

By
NEIL WILLIAMS

New Pool Prospects in Two Parishes in South Louisiana

HOUSTON, Tex., Feb. 20.—The testing of two prospective pool openers in coastal Louisiana, and the opening of Wilcox (Tertiary) production in the Segno field, Polk County, held the attention of operators along the Gulf Coast area.

Vendome Petroleum Corp. may open the first oil production in St. Bernard Parish, coastal Louisiana, as 9⅝-inch casing was being cemented in No. 1 Kenilworth Plantation preparatory to testing 68 feet of sand logged at intervals at 10,450-10,650 feet. The hole is bottomed at 10,863 feet, and casing is expected to be cemented on bottom. An electrical survey showed broken sand and shale at 10,597-10,650 feet, with the top 20 feet showing 14 ohms resistivity on third curve and the remainder of the section showed from 5 to 6 ohms resistivity on normal curve. The survey also showed 10 ohms resistivity on a 15-foot sand section at approximately 10,450 feet. Side wall cores at 10,597-10,650 feet are reported to have carried a good odor and taste of oil.

The well is located on the east side of the Mississippi River in Section 59-13s-14e, approximately 25 miles southeast of New Orleans and about 6 miles northeast of the town of St. Bernard.

In the Chalkley area, Cameron Parish, Humble Oil & Refining Co. was preparing to make a production test of No. 1 Cameron Parish School Land which is expected to open that area's first oil production although it was opened last year as a distillate field. The hole is bottomed at 9,101 feet, and casing is being cemented to test 32 feet of sand cored at 8,943-75 feet. The sand carried a good odor of oil and gas and tested 4 per cent oil by a volume test. An electrical survey showed 3½ ohms resistivity on normal curve. Slight shows were also logged at 8,980-86 feet.

The well is in Section 16-12s-6w, about 1 mile from the company's No. 2 K. B. Hanzen, the discovery well, which is producing distillate from sand at 8,562-68 feet. This is the seventh test on the prospect and was drilled jointly with Shell Petroleum Corp., which controls considerable acreage thereabouts.

In the Eola field, Avoyelles Parish, Sid Richardson has derrick up for a second test, No. 3 Haas Investment Co., 1,200 feet south and 1,890 feet west of the NE cor. Section 7-2s-3e. Pomo Production Co. No. 1 Sentel, northeast of the discovery well in Section 5, has been spudded, while Sid Richardson No. 2 Haas Investment Co., a north offset to the discovery well, is drilling below 1,536 feet.

Shallow Prospect

In the East Hackberry field, Cameron Parish, Gulf Oil Corp. was attempting to open production from a shallow sand with the completion of No. 25 Erwin, Section 13-12s-10w. Sand showing oil was cored at 3,488-94 feet. The well is about a half mile north of the deep sand development, recently opened by Union Sulphur Co.

Another new sand for the south flank of the old Jennings field, Acadia Parish, was apparently found by Superior Oil Co. No. 16 Leckelt. This test is bottomed at 8,304 feet and casing is being cemented, preparatory to testing oil sand at 7,800-70 feet. In the same parish and in the North Tepetate field, Atlantic Refining Co. No. 1 Fournerat flowed 69 bbls. of fluid per day of which 11 per cent was wash water and the balance 51-gravity distillate. The well is in Section 11-7s-2w, and was completed through perforated casing at 7,983-86 feet.

Fohs Oil Co. No. 7 State, in the Lake Long field, La Fourche Parish, tested salt water through perforated casing at 9,197-9,202 feet, and is being completed as a distillate well at 9,816-19 feet, which is a new sand for the field.

Tide Water Associated Oil Co. No. 9 Manhattan Land & Fruit Co., Venice field, Plaquemines Parish, flowed 243 bbls. daily through a 5/32-inch choke from perforated casing at 5,700-10 feet. The same company's No. 3 Buras Levee Board topped salt at 2,274 feet and was abandoned in salt at 2,339 feet.

Wildcat Locations

Locations for two interesting wildcats were announced. In Iberville Parish and located near the town of Rosedale, Humble Oil & Refining Co. is moving in material for No. 1 Iberville Mortgage Loan Co. in Section 74-7s-10e, while in Cameron Parish and located in Grand Lake, Superior Oil Co. and others staked location of No. 1 State-Grand Lake in Section 24-13s-4w.

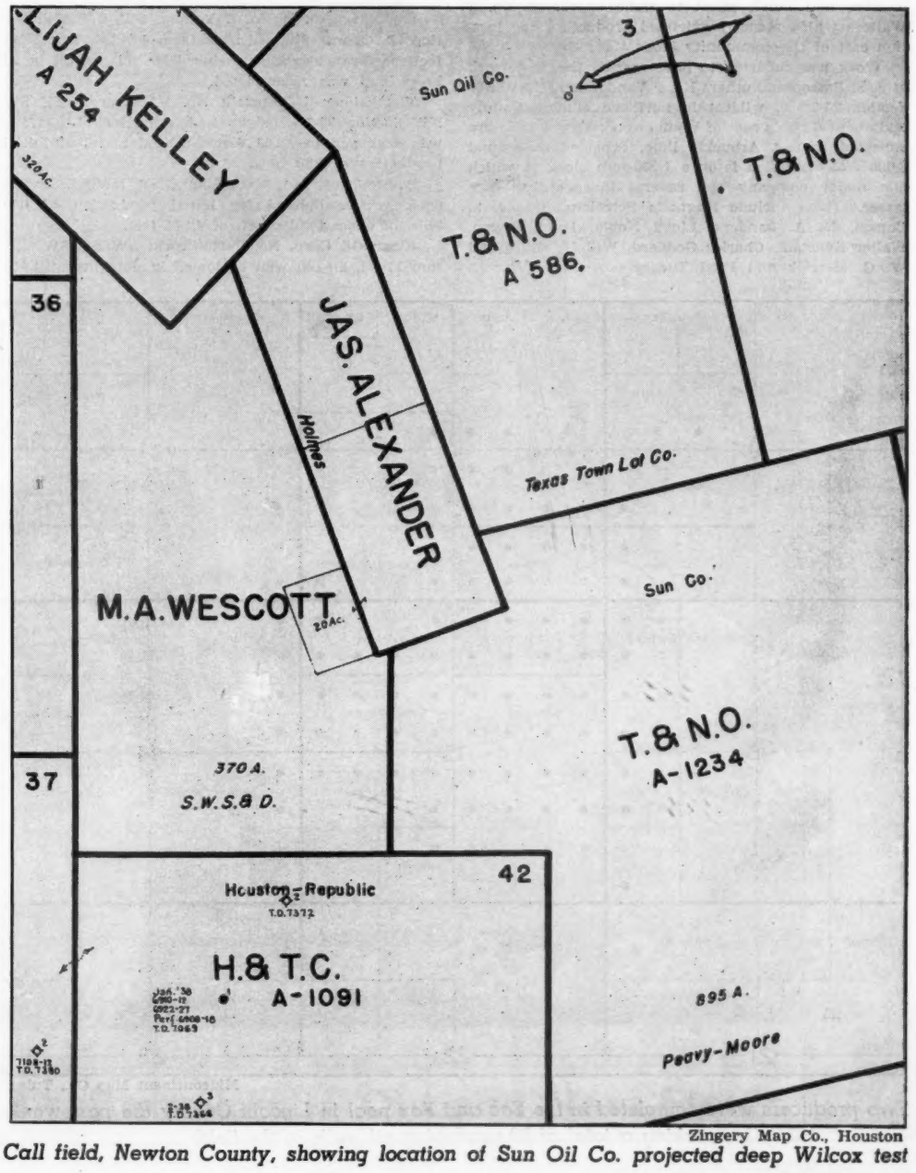
In St. James Parish, Shell Petroleum Corp. No. 1 Shexnayder, Section 38-12s-15e, is coring ahead in shale below 9,858 feet, after a drill-stem test at 9,823-32 feet, tested salt water with a slight show of oil. Several favorable showings have been logged and the well is expected to be tested after it has been drilled below 10,000 feet. Nine and five-eighths inch casing was cemented last week at 8,975 feet.

Texas Co. No. 1 Continental Land & Fur Co., a deep test in Terrebonne Parish, was temporarily abandoned at a depth of 12,483 feet. This test attempted to blow out several times below 10,000 feet, but mechanical trouble developed and no production tests were attempted.

On the Mississippi Coast

The coastal area of Mississippi is expected to re-

(Continued on Page 153)



Zingery Map Co., Houston

Call field, Newton County, showing location of Sun Oil Co. projected deep Wilcox test

Oklahoma Operations

By
DAL DALRYMPLE

Wildcats Seek Deep Pay in Edmond-Wynnewood Areas

The twenty-first well in the Ramsey pool in Payne County, Oklahoma, was expected to be completed this week at Mid-Continent Petroleum Corp. and others No. 8 Ramsey, NE NW NW Section 18-18-2e, which will extend the field one location northward if it produces. It found Wilcox sand at 4,767 feet, total depth 4,792 feet, and operators were preparing to wash in the first of the week. It is a northeast offset to No. 5 Ramsey, recently completed for daily potential of 8,148 bbls.

Other Ramsey tests include Mid-Continent Petroleum Corp. and others No. 9 Ramsey, SE SE NW Section 18, a rig; the No. 10 Ramsey, NE SE NW Section 18, a location; the No. 6 Columbia Wetzel, NE NE SW Section 18, a location, all on the community block; and same operators' No. 1 Nottingham, NW NW SE Section 18, on Carter Oil Co. acreage outside the community block, a cellar; and Stanolind Oil & Gas Co. and others No. 2 Walters, NW SW NE Section 18, a location and north offset to same operators' No. 1 Walters which recently extended production one location east of the community block.

Work was reported to have started the past week at J. S. Batson and others No. 1 Vanderslice, C SW SW Section 25-2n-2e, wildcat in northern Murray County and about 6 miles east of Wynnewood. Operators were expected to test Arbuckle lime, expected at around 3,000 feet. Location is on a 4,000-acre block in which one major company and several independents own leases. These include Magnolia Petroleum Co., J. S. Batson, N. A. Sanders, Lloyd Noble, Hugh Sturm, Walter Neustadt, Charles Goddard, Will H. Smith and W. G. Merrick and Fred Tucker.

Another wildcat in Oklahoma County was announced at Kerlyn Oil Co. No. 1 Olmstead, C E half SE NW Section 12-14-3w, 2½ miles north of the town of Edmond and northeast of the Edmond field. It was scheduled as a Wilcox sand test. The only other active Oklahoma County wildcat is R. Olsen Oil Co. No. 1 White, C NE NE Section 30-11-1e, near Newalla in the southeast part of the county, drilling below 2,380 feet.

Pottawatomie County

Mid-Continent Petroleum Corp. No. 3 Kah-dot, NW SE SE Section 36-7-4, St. Louis field, Pottawatomie County, was completed at 4,259 feet, total depth, producing 160 bbls. of oil daily.

Magnolia Petroleum Co. No. 2 Fyke A, SE SW SE Section 20-7-5, topped Calvin sand at 2,827 feet, was bottomed at 2,838 feet, and pumped 90 bbls. of oil in 24 hours.

Same company's No. 2 Younts, SW SW SW Section 20-7-5, was plugged back from 4,248 feet to 3,781 feet, perforated casing, produced 90 bbls. of oil in 24 hours and was recompleted.

Westheimer & Neustadt No. 1-A Everett, SE SW NW Section 32-7-5, originally bottomed at 4,129 feet, was deepened to 4,165 feet, acidized and had initial production of 233 bbls. of oil.

R. Stephens, Inc., No. 1 Sharp, NW NW SE Section 6-6-5, was completed for initial production of 600 bbls. of oil at total depth of 4,144 feet.

Elbar Oil Corp. No. 2 Hathcock, SW SE SW Section 11-7-4, an old well bottomed in dolomite at 4,414 feet, was deepened to Wilcox sand at 4,248 feet, total depth 4,258 feet, and pumped 135 bbls. of 40-gravity oil and 75 bbls. of water in 24 hours.

Arkhoma Oil Co. No. 2 Beam, SE SW NW Section 36-7-4, was deepened from 4,210 feet to 4,285 feet in dolomite, acidized, and pumped 115 bbls. of 39-gravity oil and 535 bbls. of water in 24 hours. Dolomite was topped at 4,173 feet.

Denver Producing & Refining Co. No. 1 Villines Estate, NW SW SW Section 36-7-4, was deepened from 4,182 feet to 4,316 feet in dolomite, acidized, and pumped 152 bbls. of oil and 920 bbls. of water in 24 hours.

Pioneer Co. No. 2 Billington, SW NE SW Section 36-7-4, pumped 250 bbls. of oil and 1,800 bbls. of water in 24 hours after deepening from 4,218 feet to dolomite at 4,168-4,283 feet, total depth.

New work in Pottawatomie County: Magnolia Petroleum Co. No. 3 Jordan, SE NE SW Section 12-7-4, pits; Wood Oil Co. No. 1 Smith, SW NE NW Section 36-7-4, cellar and pits; Magnolia Petroleum Co. No. 3 Tull-Fyke G, NE NW NE Section 29-7-5, rig; G. M. Piggott and others No. 1 Bruno, NW SE SE Section 31-7-5, rig; J. F. Smith and others No. 4 Tarter, SW SW SW Section 32-7-5, cellar and pits.

Estimated Daily Production

Estimated daily production for Oklahoma for the week ending February 18, and for the preceding week, was as follows:

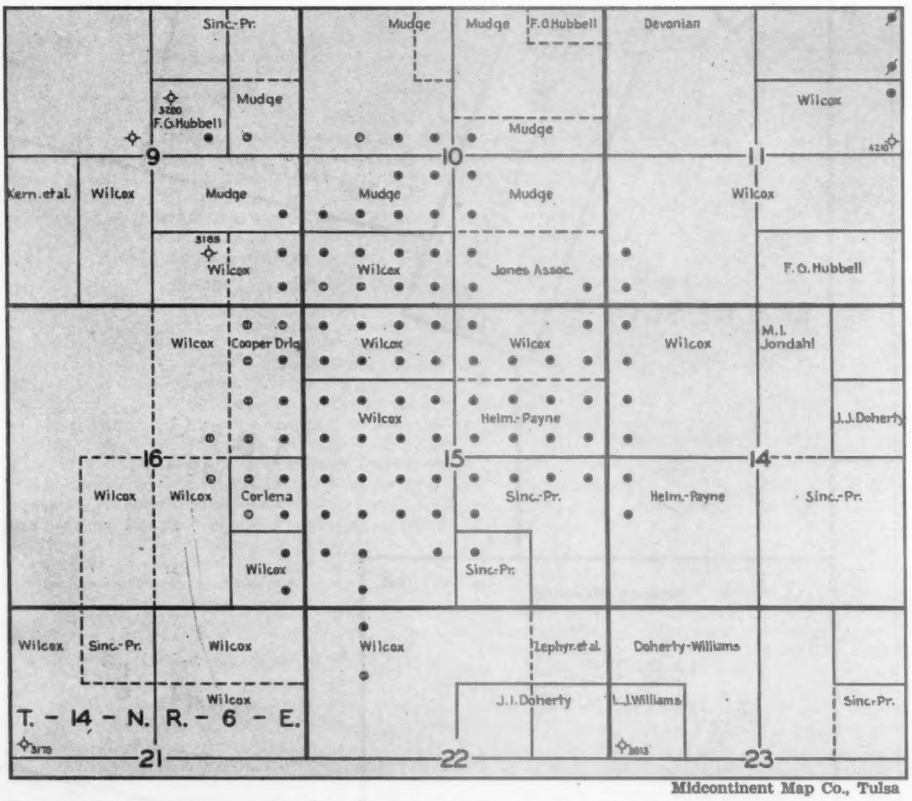
	Barrels	
	Feb. 18	Feb. 11
Allen	6,025	6,175
Billings	5,200	5,125
Burbank	7,400	7,425
South Burbank	9,375	9,350
Balance Osage	18,500	17,750
Blackwell district	3,850	3,800
Bristow-Slick	6,925	6,900
Chandler	1,750	1,725
Crescent	3,425	3,675
Cromwell	3,025	3,050
Cushing-Shamrock	10,225	10,175
Duncan district	4,275	4,200
Edmond	4,975	5,125
Fish	2,650	2,575
Fitts	31,250	31,425
Jesse	2,775	2,750
Graham-Fox	4,325	4,250
Gray	825	850
Healdton	9,050	8,850
Hewitt	3,575	3,525
Keokuk	3,825	3,850
Konawa	1,250	1,275
Lucien	7,875	7,950
Moore	4,225	4,650
Oklahoma City	111,425	100,950
Olympic	3,200	3,150
Ramsey	2,750	2,800
Sasakwa	1,275	1,300
Sholem-Alechem	2,400	2,425
Seminole district:		
Bowlegs	7,750	7,775
Carr City	2,925	2,825
Dora	4,725	4,625
Earlsboro	4,600	4,550
South Earlsboro	550	525
East Earlsboro	3,875	3,900
Little River	6,650	6,575
East Little River	700	675
Maud	875	1,025
Mission	1,400	1,425
Seminole	7,450	7,475
East Seminole	1,525	1,550
Searight	2,300	2,250
Total Seminole	45,325	45,175
St. Louis-Pearson	26,500	26,200
Tatums	1,800	1,825
Tonkawa-Garber-Thomas	4,150	4,175
Wewoka	2,150	2,125
Yale-Jennings	3,675	3,650
Other pools	83,250	83,000
Total Oklahoma	444,475	433,200

Seminole County

Rogers & Rogers No. 1 Swan, SW SW NE Section 36-7-5, Hazel district, was dry and abandoned at 4,540 feet, total depth.

Mid-Continent Petroleum Corp. No. 1 Tiger, NE SW SE Section 12-6-5, Grayson area, Seminole County,

(Continued on Page 144)



Midcontinent Map Co., Tulsa

Two producers were completed in the Sac and Fox pool in Lincoln County the past week, making a total of 88 producing oil wells in the field

under hardest pressure

Other J & L Steel Products:

J & L A.P.I. Casing, Tubing, Drive Pipe and Line Pipe in seamless and welded—J & L A.P.I. Seamless Drill Pipe—J & L Integral-Joint Drill Pipe—J & L Bell and Spigot Casing—J & L Seamless Boiler Tubes—J & L Standard Pipe in seamless and welded—Steel products for construction and maintenance.

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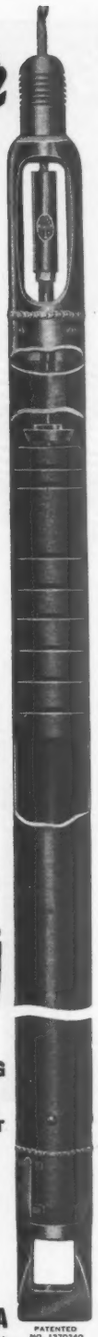

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The MILLER is made in diameters of 2½, 2, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type. ¼-inch wall tubes in HEAVY Type Sand Pumps.

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To Meet Every Condition

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- **SAND BOTTOM** Used when tools are run and when well is shot to quickly remove loose material.
- **STAR BOTTOM** Used for cutting the sand loose.
- **CHISEL BOTTOM (In Pump)** With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Pages 1564-65 COMPOSITE CATALOG

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C. L. & W. W. AUER
Established 1880 Corry, Pa.

found top of Wilcox sand at 3,798 feet, drilled to total depth of 3,800 feet and was completed for 301 bbls. of oil daily.

Eason Oil Co. No. 1 Fish, SE SW SE Section 19-7-8, Fish pool, topped dolomite at 4,070 feet, was bottomed at 4,100 feet, and flowed 1,104 bbls. of oil in 24 hours.

First reports of new activity in Seminole County: Sunray Oil Co. No. 1 Collins, NW SE SW Section 12-6-5, location; Hall-Troup & Moore No. 1 White, NW SW SE Section 30-6-8, location; Rogers & Rogers No. 2 Fisher A, SE NW SW Section 25-7-5, rigging up rotary; Commercial Drilling Co. No. 1-A Wright, NW SW SE Section 32-7-6, drilling below 1,373 feet; Farmers Mutual No. 2 Waite, SE NE NW Section 9-5-5, cellar and pits.

Pontotoc County

Grisso Royalty Co. No. 1 Beck, NE NE SE Section 35-5-7, Pontotoc County, found Gilcrease sand at 2,304 feet, total depth 2,369 feet, plugged back to 2,306 feet and pumped 10 bbls. of oil in 24 hours.

Phillips Petroleum Co. No. 18 Norris, SE SW SW Section 25-2n-6, Fitts field, an old well, was plugged back from 3,678 feet to 2,846 feet, shot in Cromwell sand at 2,629-2,725 feet, and flowed 146 bbls. of 36-gravity oil in 24 hours.

Magnolia Petroleum Co. No. 2 Young, NE NE NW Section 22-2n-7, an old Fitts pool well, was plugged back from 4,331 feet to 1,749 feet, shot in McAlester sand at 1,370-1,400 feet and pumped 37 bbls. of 33-gravity oil and 10 bbls. of water in 24 hours.

Senora Oil & Gas Co. No. 2 Cox, SE NW NW Section 17-5-5, had dug cellar and pits. R. W. Vierson No. 1 Harrell & Kerr, SW SW SW Section 15-5-5, was rigging up rotary.

Lincoln County

Cooper Drilling Co. No. 2 School land, NE SE NE Section 16-14-6, on the west side of the Sac and Fox pool, Lincoln County, topped Prue sand at 2,962 feet, was bottomed at 3,064 feet, shot with 330 quarts, and had initial daily production of 222 bbls. of oil.

Helmerich & Payne, Inc., and others No. 2 Kenworthy, SW NW SW Section 14-14-6, farthest southeast producer in the pool, found Prue sand at 2,900 feet, total depth 3,006 feet, was shot with 200 quarts and pumped 15 bbls. of oil in 24 hours.

Creek County

McAdams & Thornton No. 1-A Fast, SE SE NE Section 36-17-9, in the Kellyville district, Creek County, was completed at 2,712 feet, total depth, pumping 25 bbls. of oil daily.

R. B. Wright No. 26 Meyer, SW NE NW Section 24-17-10, Kellyville area, pumped 15 bbls. of oil daily and was completed at 1,835 feet, total depth.

Indo Oil Co. No. 1 Stanley, SW SW SE Section 33-18-10, pumped 60 bbls. of oil daily at total depth of 2,630 feet and was completed.

Atlantic Refining Co. and others No. 3 Bear A, SW NE NW Section 16-14-10, Donelly area, an old well, was deepened to 3,358 feet and pumped 120 bbls. of oil daily.

Recent failures in Creek County included: Dixie Oil & Gas Co. No. 1-A Lumm, SW SW NE Section 8-14-8, at 1,150 feet, total depth; Deffendoug and others No. 1 Ross, NE NE SW Section 32-14-8, at 2,532 feet; Freeland & Slyman No. 1-A Willard, SE NW NW SE Section 11-17-9, at 1,806 feet; Burke-Greis Oil Co. No. 1-B McMeehan, SW NW NW Section 7-18-9, at 3,225 feet; E. R. Black No. 1 Anthis, NE NE SE Section 22-18-9, an old well deepened to 3,192 feet and abandoned.

Okmulgee County

E. R. Black and others No. 1 Tomlin, NE SW NE Section 8-14-11, Okmulgee County, was dry and abandoned at 3,018 feet, total depth.

Steckal Pipe & Supply Co. No. 4 Flynn, CEL SE NE Section 23-16-12, failed to find production and was abandoned at 1,885 feet, total depth.

Elbert Hinds, Trustee, No. 4 Lewis, SW NE SW Section 6-14-15, was a machine. J. Moore and others No. 1-A Lowrey, SW NE SW Section 10-15-14, had spudded.

Tulsa-Muskogee Counties

Musellem No. 1 Blackstone, SW SW NW Section 19-12-20, Muskogee County, was dry and abandoned at 1,148 feet, total depth.

R. L. Hollifield No. 1-A Durant, NW SE NW Section 27-14-15, Muskogee County, was abandoned at total depth of 800 feet.

Holmes & Lange No. 4 Easley, NE SW NW Section 7-19-10, Keystone district, Tulsa County, pumped 6 bbls. of oil in 24 hours and was completed at 1,185 feet, total depth.

Sendorf and others No. 1-A Self, NW NW SW Section 36-17-12, Tulsa County, was drilling below 350 feet when first reported.

Bryan Petroleum Co. No. 2 Mathews, NE NW NE Section 19-15-15, was drilling below 140 feet, and Carolyn Oil Co. No. 1-A Smith, SE SW NW Section 19-15-18, was a machine. Both are in Muskogee County.

Payne-Pawnee-Osage Counties

Mid-Continent Petroleum Corp. No. 4 Brandon, NW SE NE Section 13-18-1e, Ramsey pool, Payne County, found Wilcox sand at 4,826 feet, flowed 1,086 bbls. of oil in three hours and made 24-hour potential of 8,699 bbls. of oil. Gas gauged 5,000,000 feet.

Gulf Petroleum Corp. No. 3 George, SW NW N Section 4-19-5, Garr area, Payne County, pumped 23 bbls. of oil of oil in 24 hours and was completed.

L. F. Ice No. 1 Applegate, SW SW NW Section 34-20-9, Keystone area, Pawnee County, was dry and abandoned at 2,930 feet, total depth.

Peters & Norbia No. 1 Osage, 300 feet from the south and east lines of NW Section 17-14-7, Osage County, found Bartlesville sand at 2,604-18 feet, total depth 2,621 feet, was shot with 20 quarts at 2,604-18 feet and swabbed 15 bbls. of oil and 2 bbls. of water in 24 hours.

Ohio Osage Oil Co. No. 12 Osage, SW SE NE NW Section 34-21-9, and Barnsdall Oil Co. No. 8 Osage, SW NE NE SW Section 23-24-10, were locations.

Southwestern Oklahoma

Carl Carter No. 2-D Warden B, NE SE NW Section 34-1s-5w, Stephens County, Velma pool, had sands at 542-53 feet and 705-30 feet, was bottomed at 738 feet, shot and pumped 8 bbls. of 28-gravity oil in 24 hours.

T. H. McCasland No. 1-A Horsman, NE SE NW Section 8-3n-5w, Knox pool, Grady County, tested a broken sand series at 2,592-2,790 feet, total depth, had only a showing of oil with water and was abandoned.

York-Kan Oil, Inc., No. 1 Sloan, SE SW NW SE Section 3-5-9w, Cement field, Caddo County, put a damper on Cement townsite operations. It is on Lot 5, Block 42, of the townsite. Only a slight showing of oil was found in Rowe sand at 3,425-40 feet, and it was dry and abandoned in sandy shale at 4,000 feet, total depth.

Tom Palmer Oil Corp. No. 2 Dixon, SW SW NW Section 35-6-10w, Caddo County, was a location.

T. H. McCasland No. 1-A Bulbas, SE SE NE Section 17-3n-5w, Grady County, had dug cellar and pits.

B. M. Densmore No. 1 School land, NE NW SE Section 20-2n-10w, Lawton pool, Comanche County, was rigging up machine.

Carl Carter No. 3-D Warden B, NE SE NW Section 34-1s-5w, Velma pool, was a location. Skelly Oil Co. No. 24 Glass, SW cor. Section 33-1s-8w, an old well in the Empire pool, was a machine, preparatory to deepening. Both are in Stephens County.

Wildcat Reports

Burke-Greis Oil Co. No. 1 Alberts, SE SW NW Section 19-7-1w, wildcat southeast of Noble in Cleveland County, had hard, white Wilcox sand 7,710-35 feet, total depth, and was dry and abandoned.

Leslie Rogers No. 1 Kidd, NE SW SE Section 33-10-8, Seminole County wildcat, was an abandoned location.

Hurst and others No. 1 Rooney, NE NE SW Section 26-13-3e, wildcat in Lincoln County, was an abandoned location.

Jim Wise Drilling Co. No. 1 Morrow, SW NW NE Section 16-15-13, Natura district, Okmulgee County, wildcat, was dry and abandoned at 2,657 feet.

Scruggs and others No. 1 Lanning, SE SW SW Section 19-12-15, was location for a wildcat about 3 miles south of Hitchita in McIntosh County. It is scheduled to be a cable tool test to Wilcox sand.

Midnight Oil Co. No. 1 Howe, NW NW NE Section 20-2n-13w, an old wildcat east of Cache in Comanche County, was deepened from 703 feet to 746 feet and was fishing.

C. Giblet No. 1 Rich, SW Section 33-1n-14, wildcat west of Chockie in Atoka County, was drilling ahead.

Kenneth Ellison and associates were moving in tools at No. 1 Baker, NE NE SW Section 20-19-5w, Kingfisher County wildcat.

Work was reported to have started at Enterprise Drilling Co. No. 1-A Wahl, NW Section 1-19-25w, wildcat in the Arnett area, Ellis County.

Michigan Field Report

By
O. C. PRESSPRICH

4,000-Bbl. Well in Redding Field; Two Pool Discoveries

SAGINAW, Mich., Feb. 20.—Completions indicating two promising new pools shared with the news of an important big producer in an only slightly developed field to highlight last week's progress in Michigan oil fields.

New production was greatest in the Clare County field, where Socony-Vacuum Oil Co. completed one of the biggest producing wells in Michigan in recent months. Located in Clare County's Redding Township, it came in with 2,000 bbls. daily natural flow and was stepped up to between 4,000 and 5,000 bbls. after getting acid treatment. Redding Township also was the scene of a 2,000-bbl. daily producer as Turner Petroleum completed No. 1 Wheeler.

North of Hartford, in Van Buren County, drillers brought in No. 1 Jackson, promising a productive new pool in Bangor Township. Traverse pay was reported reached at 1,010 feet and a strong show of gas accompanied the discovery. Another Van Buren County wildcat test produced a natural flow of 50 bbls. daily in Section 24 of Columbia County.

The first producer in Hopkins Township of Allegan County had a natural flow of 90 bbls. After being treated with acid the yield increased to 225 bbls. a day.

Increased activity continued, the week bringing 25 completions adding a potential daily flow of better than 9,300 bbls. to the Michigan total. Four completed wells in Clare County indicated production totaling 7,500 bbls.; six in Van Buren added 1,100 bbls., five in Allegan County accounted for 675 bbls.

Fifteen of the completions produced from the 5,000-bbl. top to a 10-bbl. minimum in a new well in Van Buren County. Eight others were abandoned and on two others verifiable figures were awaited as the week closed.

Of the failures, chief disappointment came about as drillers quit at 3,962 feet on the initial attempt in an 8,000-acre lease in Sylvan Township, Osceola County.

Allegan County

Hopkins Township (3n-12w)—A new field in Allegan County was indicated by the success of Chulsky & Varner No. 1 Brower, NW SW NW Section 23. The well, first producer in Hopkins Township, flowed 90 bbls. naturally, increasing to 225 bbls. daily after being acid-treated. The oil showed at a depth of 1,625 feet.

Overisel Township (4n-14w)—Failure tagged after the previous week's success in Overisel development as the current week's only additional completion, dry at 1,468 feet, was abandoned. The well was the Crown Development Co. No. 2 James H. Nyhuis, SE SW SE Section 22.

Salem Township (4n-13w)—Four of the five completions in Salem Township brought oil, adding 450 bbls. daily to the field's potential; a fifth completion failed. Two of the producers showed water, however. Muskegon Oil Corp. No. 1 William Miller, SE NE NE Section 10, production 50 bbls. daily after acidization, but also brought water; at 1,625 feet oil rose 700 feet before treatment. The Mesel & Spielberg No. 3 Clarence Jager, SE NE SE Section 21, was drilled in at 1,561 feet, from where the natural flow raised 300 feet of oil. After acid treatment yield increased to 150 bbls. daily, oil and water. Two completions in Section 22, Petroleum Enterprises No. 1 Harig Heirs, NW NW NE, and Regal Dutch Petroleum Co. No. 3 Smith Estate, NE NE NW, were better. Both drilled in at 1,572 feet, the former producing 150 bbls. daily, the latter 100 bbls., both free of water. M. L. Jorgensen No. 1 Fred Weber, NE SE NE Section 10, was abandoned at 1,659 feet.

Arenac County

Deep River Township (19n-4e)—Still dry at 1,896 feet, Hal-Be-Oyle & Gas Corp. No. 1 Steve and Theresa Kozmar, SW SW NW Section 30, was abandoned, at least temporarily.

Clare County

Redding Township (19n-6w)—Activity in this area spurted as three of four completions continued the recent trend of heavy producers newly developed in this proved field. Ranked as one of the best in Michigan in recent months, the Socony-Vacuum Oil Co. No. 1-B L. G. Fell, NW NE Section 33, flowed 2,000 bbls. naturally and was acidized to 5,000 bbls. daily. The strike came at 3,889 feet. Turner Petroleum No. 1 Wheeler, SE NE NW Section 34, was acidized to 2,000 bbls. daily. The C. L. Maguire No. 1 Goldsmith-Wine, SW SW SE Section 34, flowed 350 bbls. naturally when drilled in at 3,890 feet, but the Maguire No. 1 Charles Wheeler-State, NW NW NE Section 34, was handicapped by considerable water at 3,903 feet, although the natural oil flow started at 180 bbls. daily.

Ogemaw County

Mills Township (21n-3e)—T. F. Caldwell No. 9 State, SW NE NW Section 6, came in a small producer at 3,637 feet. After the natural flow pushed oil up the hole 900 feet the well was acidized to 25 bbls. daily.

Osceola County

Sylvan Township (18n-7w)—First efforts in a new area in Osceola County proved a disappointment and Michigan Devonian Petroleum Co. abandoned its No. 1 Arley H. Reedy, SW NW SW Section 10, which was still dry at 3,962 feet.

Ottawa County

Georgetown Township (6n-13w)—Red Man Oil Co. No. 1 A. Tate, NE SW SW Section 16, was abandoned at 1,782 feet.

St. Clair County

Fort Gratiot Township (7n-17e)—The Swanson Consolidated Oil Co. No. 1 W. L. Day, NE SW SW Section 29, was abandoned.

Van Buren County

Bangor Township (2s-16w)—Oil men interested in this area visioned a productive new Van Buren County oil pool as drillers brought in oil on the Blood & Hendershott No. 1 Ellen Jackson, NE NE NE Section 29. The Traverse pay, it was reported, was tapped at 1,010 feet. A strong show of gas accompanied the discovery and operators eagerly awaited first figures on the well's productivity.

Bloomingdale Township (1s-14w)—One good well, a fair one, a mediocre third and a failure developed over the week in the active Bloomingdale shallow pool. The William P. Shoemaker No. 1 Sage, NW SE SE Section 14, acidized to 160 bbls. daily. M. R. & T. Oil No. 3 Merrifield & Hill, NE NE NE Section 17, yielded 600 bbls. daily after acid treatment. Flowing 250 bbls. naturally and an estimated 2,500 bbls. daily on a brief test after acid treatment, the best showing in several weeks came with the R. T. & E. Corp.-H. R. Allen No. 1 Charles Clinkenbeard, NE NW NW Section 17. Wiser Oil Co. No. 5 Bruce Boyers, SE SE SW Section 17, dry at 1,249 feet, was abandoned.

Columbia Township (1s-15w)—Another wildcat test in Columbia Township flowed 50 bbls. naturally. It was Clifford F. Clapsaddle-Lester W. Harris No. 1 Frederick Been, NW NW NE Section 24. Two small producers were completed in Section 11. The D. F. Jones No. 1 Fox Heirs, NW NE SE, at 1,225 feet, had a 10-bbl. natural flow daily, while the Harry W. Leman, Jr., No. 1 Nina Foster, NE SE SW, at 1,190 feet, was acidized to 62 bbls. daily.

Hartford Township (3s-16w)—Dry at 1,018 feet, the Wright & Miller No. 1 Dorsey McConnell was abandoned.

New York-Penna. Gas Fields

COUDERSPORT, Pa., Feb. 18.—There were no completions during the past week in the New York-Pennsylvania Oriskany sand gas fields but three new operations have been started, two of them in the recently opened Cameron Township, Steuben County, area. New Penn Development Co. is moving in on the Sylvania Allen and others farm and New York State Natural Gas Co. is digging cellar for a test on the Herbert Thompson farm in Cameron Township. The third location is in Bingham Township, Potter County, where New York State Natural Gas Co. is moving in on the Ladd Estate farm.

Allegany Gas Co., drilling at 4,724 feet in the deepest of the current Sharon Township, Potter County, wells passed the Tully lime at 4,264-4,313 feet on the Dickerson farm this week. Also in this township Belmont Quadrangle Co. is drilling at 3,585 feet on the N. Kemp farm, G. L. Cabot, Inc., at 2,374 feet on the Plank School farm; Empire Producing Co., at 2,275 feet on the F. Dickerson farm; New Penn Development Co., at 1,558 feet on the Gorton-Kemp farm; Sylvania Corp., at 725 feet on the Elmer Kemp farm, and Belmont Quadrangle Drilling Co. at 500 feet on the Wolcott No. 2. In addition New Penn Development Co. has the rig up on the Dunshie farm and G. L. Cabot, Inc., is building the rig on the Reva Kemp farm.

In other Potter County operations Evjen, Harris and others are shut down at 2,440 feet on the A. R. Mitchell farm, Sweden Township; G. L. Cabot, Inc. is drilling at 3,250 feet on the William Cobb farm, Allegany Township; Penn York is running casing in the No. 2 Lena Barnes, Harrison Township, where the Tully was passed at 4,249-99 feet and where the Onondaga was reached at 4,906 feet; New York State Natural Gas Co. is drilling at 2,492 feet on the F. McCarthy farm and Sylvania Corp. is drilling at 850 feet on the Harrison No. 2, both in Bingham Township, and Cunningham Natural Gas Co. is rigged up on the F. Markey farm in Oswayo Township.

Both of the wildcat operations in McKean County were shut down, New Penn-McKean at 4,701 feet on the Glenn Taylor farm in Ceres Township and Penn Brad Oil Co. at 4,000 feet on Warrant 5574, Hamilton Township.

The first test to spud in in Cameron Township, Steuben County, since the completion of the discovery well on the Boyd farm last month, was the New York State Natural Gas Co. well on the William Preece farm which is now drilling at 273 feet. Hanley & Bird have a location on the Lloyd Hall farm and Belmont Quadrangle Drilling Co. is building the rig on the Andrew Taft farm.

Most of the other Steuben County operations are in Woodhull Township, where Hanley & Bird got a flow of 2,500,000 cu. ft. on the G. H. Rice farm. This well topped the Onondaga at 3,733 feet and the Oriskany at 3,768 feet. It was cased to 3,742 feet. At the end of the week it was reported drilling at 3,780 feet. Sylvania Corp. is drilling at 2,435 feet on the Della Calhoun farm, and New York State Natural Gas Co. at 148 feet on the Parks No. 3 and at 3,485 feet on the Meade farm where the Tully was found at 3,226-76 feet, also in Woodhull Township.

G. L. Cabot, Inc. is drilling at 4,106 feet on the Ray Scribner farm after passing the Tully at 3,478-3,530 feet and is shut down on the L. Highland farm,

(Continued on Page 154)

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ontario, Feb. 18.—Deliveries to the Calgary refineries from Turner Valley in January totaled 459,902 bbls. compared with 429,165 bbls. in December. In January, Imperial Oil Refineries took 328,057 bbls. of crude and 30,812 bbls. of naphtha. British American Oil Co. took 100,824 bbls. of crude and 209 bbls. of naphtha. Deliveries reached a peak in September, 1938, of 746,026 bbls., but the smaller figure since then is due to more drastic proration.

Canadian Crude Production

Official figures of Canadian crude production show a December total of 489,303 bbls. compared with 445,514 bbls. in November. New Brunswick production declined from 1,401 to 441 bbls., and Ontario production from 16,877 to 16,088 bbls., while Alberta production increased from 427,236 to 472,744 bbls.

The December totals bring the crude production from all Canadian fields in 1938 to a record total of 6,946,479 bbls. compared with 2,996,033 bbls. in 1937; the 1938 totals including an estimate of 10,000 bbls. from the Fort Norman field in the Northwest Territories. Comparative figures for the two years for the various provinces are:

	1938 (bbls.)	1937 (bbls.)
New Brunswick	23,081	22,549
Ontario	171,359	165,205
Alberta	6,742,039	2,796,908
NW. Territories	10,000	11,971
Total	6,946,479	2,996,033

Home 2 Largest Producer

Home Oil Co. No. 2 Millarville, LSD 6, Section 33-20-3w5, the outlying producer in the northwestern end of Turner Valley, finished in the lime at 8,495 feet, has been given an official allowable of 328 bbls. compared with previous temporary allowable of 276 bbls. This makes it the largest producer in the field, the next well being Royal Canadian Oil Co. No. 2, with 302 bbls. Retesting of Home No. 2 showed bottom-hole pressure of 2,390 pounds, the largest in the field, and gas-oil ratio of 654 feet, much lower than any other crude well. Production with 2-inch choke was 2,425 bbls. a day and with 1-inch choke 2,214 bbls.

Home Oil Co. is planning to drill one or more wells on its own acreage, in addition to arranging for tests by other companies.

Turner Valley Completions

In Southwest Turner Valley, Anglo-Canadian Oil Co. No. 3, LSD 10, Section 17-18-2w5, finished in the lime at 7,738 feet with temporary allowable of 199 bbls. flowed 2,119 bbls. through 1-inch and 2,264 bbls. through 2-inch choke. It has been given a new allowable of 253 bbls.

In the far south, D. & D. Oils No. 1, LSD 12, Section 9-18-2w5, finished in the black lime at 7,400 feet, has cleared drilling fluid and is testing after acidizing with 10,000 gallons. Previous production was estimated around 500 bbls. a day after the first light acid treatment.

Okalta Shut Down

West of the proven field, Okalta Oil Co. No. 6, LSD 3, Section 30-18-2w5, which got water in the lime at a record depth of 10,209 feet and was later cemented back to 9,994 feet for a test of the upper porous horizons, has suspended operations temporarily following difficulties encountered in swabbing. The rotary outfit is being dismantled and moved to Okalta No. 8, LSD 6, Section 16-18-2w5, which will be deepened from 2,820 feet. Later a bottom-hole pump may be installed at No. 6, and the casing may also be gun-perforated to take light crude production from the Home sand, around 9,202 feet.

Tests in the Lime

Royalite Oil Co. has three wells nearing completion in the lime. In West Central Turner Valley, Royalite No. 37, LSD 11, Section 5-19-2w5, offsetting Vulcan Brown No. 1 producer to the west, finished around 7,597 feet, after getting the lime at 7,193 feet, and is preparing to test production.

In Section 32-18-2w5, Royalite No. 36, LSD 13-14, finished at 7,910 feet, 450 feet in the Madison and is testing production.

In North Turner Valley, Royalite No. 35, LSD 7, Section 27-20-3w5, got the Madison contact at 6,173 feet and is deepening after cementing casing in the top of the lime.

In Section 7-19-2w5, West Central Turner Valley, Valley Drilling Co. No. 1, LSD 11, is below 225 feet.

West Side Drilling

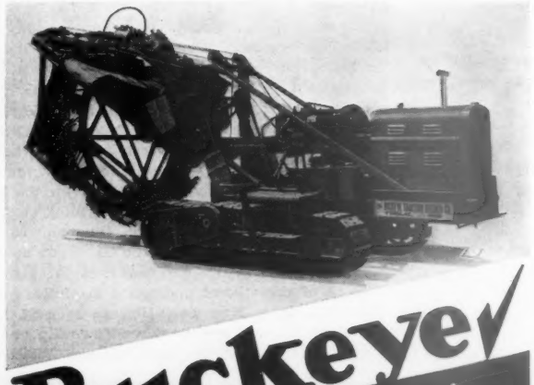
In Section 29-18-2w5, Royalite Oil Co. No. 39, LSD 3, is spudding. Royal Canadian Oil Co. No. 3, LSD 12, is erecting derrick on acreage formerly held by Sunalta Oils. Union Drilling Co., of Calgary, will handle the contract, using rotary tools.

In Section 17-18-2w5, Anglo-Canadian Oil Co. No. 4, LSD 6, is below 2,048 feet after setting surface casing at 1,320 feet. Extension Royalties No. 2, LSD 11, is rigging rotary outfit from Anglo-Canadian No. 3 producer. Drilling Contractors, Ltd., are handling the contract. Location is south of Extension No. 1 producer which has allowable of 277 bbls. Anglo-Canadian No. 6, LSD 3, is below 684 feet, using rotary outfit from the company's No. 1 Steveville well. With derrick up, equipment was moved from Steveville and rigged ready to spud in three days.

In Section 16-18-2w5, Okalta Oil Co. No. 8, LSD 6, is preparing to deepen from 2,850 feet, using rotary from No. 6 deep test.

Royalite Drilling Program

Announcement has been made that the Royalite Oil Co. has budgeted $1,832,300



Buckeye

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for development of its Turner Valley holdings and is planning to drill 11 or 12 wells in the 1939 drilling season. In 1938 the amount budgeted for Turner Valley was $2,114,800 including over $1,000,000 for the new trunk pipe line from Turner Valley to Calgary; while the 1937 budget was $1,409,400. Royalite No. 40 has been spotted in LSD 4, Section 5-19-2w5, offsetting Anglo-Canadian No. 1 producer to the north and East Crest No. 4 to the southeast.

The 1939 allotment for Turner Valley development includes $1,066,700 for actual drilling, with $196,400 for production equipment.

New Drilling Planned

Davolite Oil Co. has secured permit for its No. 1 test in LSD 10, Section 18-19-2w5, west of the old Home Oil Co. naphtha wells. Farther south, Valley Drilling Co. No. 2 has location in LSD 14, Section 7-19-2w5.

In North Turner Valley, National Petroleum Corp. has secured approximately 11,000 acres in Townships 20 and 21, Ranges 3 and 4, west of Home Oil Co. No. 2 producer. Russell V. Johnson will select a location for a well to be started in the spring.

Conservation Board Tests

Tests completed last month by the Alberta Conservation Board showed a substantial improvement in both bottomhole pressures and gas-oil ratios compared with last September. At that time, some 110,000,000 cu. ft. of gas was required to raise 25,750 bbls. of crude, while in the January tests 37,000,000 feet were required for 13,500 bbls. The average gas oil ratio decreased from 4,400 to 2,750 feet per barrel.

The heaviest gas-oil ratio is in Model-Spooner No. 1, LSD 4, Section 28-18-2w5, which decreased from 31,500 feet in September to 30,395 in January, thereby bringing the well back into the crude oil category. The lowest gas-oil ratio at the time was Sunset Oils No. 1, down from 1,340 to 765 feet; though subsequent tests gave Home Oil Co. No. 2 a ratio of 654 feet. Of 68 wells tested, only 13 showed increased gas-oil ratios.

Tests show the measured flow of the field, excluding D. & D. Oils, Producers Crude Corp. and Royalite No. 33 wells, to be 53,387 bbls. a day through 1-inch and 70,252 bbls. through 2-inch choke. Allowables now aggregate 10,000 bbls. a day, the lowest figure since proration was adopted.

Gravity of the crude ranges from 41 in Anglo-Canadian No. 1 producer, worth $1.16 a barrel, to 52, worth $1.38, in West Side Royalties No. 1. Home No. 2 Millarville showed 42 gravity; and in general the outlying wells show the lower gravity.

East Side Drilling

Arrangements have been made to resume work on McLeod Oil Co. No. 1, LSD 4, Section 6-21-2w5, on the New Valley structure, as soon as the weather moderates. The well, located about 4 miles east and a little north of Home No. 2 Millarville, has been standing at 8,450 feet after getting crude, approximating commercial production, in the Cardium sandstone at 6,657 feet. This marker was about 243 feet higher than in Arca Development Corp. No. 1 deep test, farther south, which got the Madison lime at 8,750 feet and was abandoned at 8,988 feet.

Work is expected to resume this spring on Ranchmen's Oil Co. No. 1, LSD 16, Section 13-20-29w4, on the Aldersyde structure, standing in the Dalhousie formation at 7,230 feet after encountering several good shows of light crude. This test logs about 1,400 feet higher than the Arca well and should get the Madison limestone within 200 to 300 feet and the producing horizon around 8,000 feet.

Northern Foothills

On the Brazeau structure, in the northern foothills west of Edmonton, Home Oil Co. No. 1, LSD 16, Section 7-43-17w5, bottoming at 4,520 feet, has 10-inch casing down to 4,474 feet.

On the Clearwater structure, Altoba No. 1, Section 31-34-9w5, has resumed from 1,318 feet after setting casing at 1,190 feet. Production test was made of a sand between 1,196 and 1,286 feet which had nice shows of 39-gravity crude. There was not enough gas to lift the oil, however, so the diamond-drill hole will be continued into the Lower Devonian.

On the Ram River structure west of Rocky Mountain House, Ram River Oils No. 1, Township 38-12w5, is temporarily shut down at 850 feet with frozen water supply. Oil showings were met at 590, 650 and 805 feet, all in the Devonian limestone, which was contacted at 72 feet.

On the Grease Creek structure, Grease Creek-Northwest Co. No. 1, LSD 2, Section 13-29-7w5, is in the lower Benton formation below 1,450 feet after encountering a small gas show in the Cardium sandstone.

Southern Foothills

On the Highwood Sinclair structure, southwest of Turner Valley, Green Valley Oils No. 1 Banner, LSD 6, Section 34-17-3w5, is shut down at 6,740 feet, 1,380 feet in the Madison lime, owing to bad weather.

On the Savannah Creek structure, Anglo-Canadian Oil Co. No. 1, SW quarter Section 20-14-4w5, is standing cemented at 90 feet.

In the Pincher Creek area, Anglo-Canadian No. 1 Castle River, LSD 4, Section 11-6-1w5, is below 5,990 feet.

Border Fields

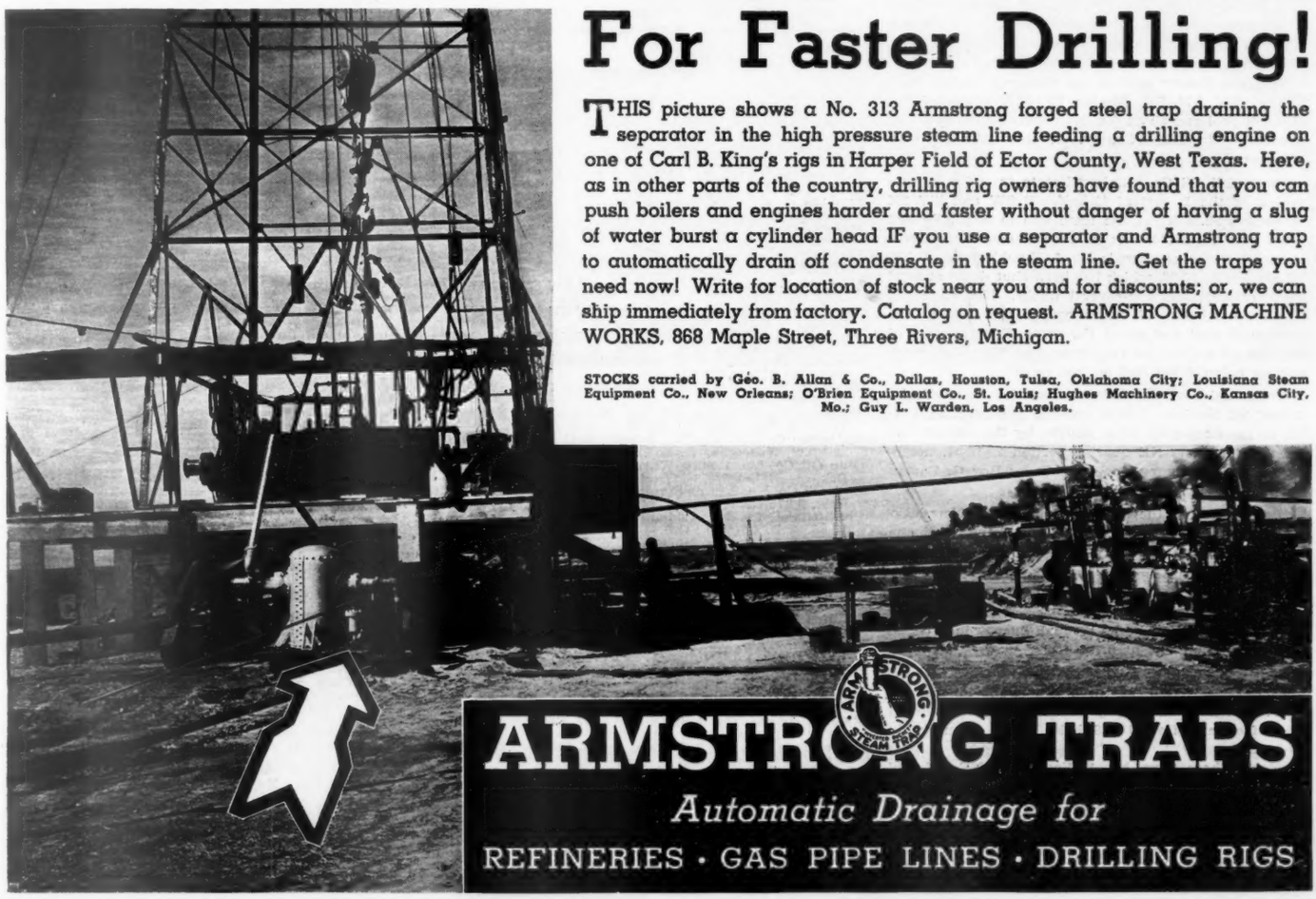
West of Taber, Border Petroleums No. 1, LSD 5, Section 32-19-17w4, is underreaming and carrying 8-inch casing around 2,500 feet.

On the Bridge Dome structure, Anglo-Canadian No. 1 Milk River, LSD 10, Section 4-2-13w4, is preparing to resume after cementing 10-inch casing in the top of the Madison limestone at 2,452 feet.

The Alberta Board of Industrial Relations at Edmonton has reported against any change in working hours in the Turner Valley field for the time being. As a result the six-day week of 48 hours will be continued.

Heavy Crude Area

A potential field of heavy crude in West Central Saskatchewan and East Central Alberta is indicated by the strike in Lloydminster Royalties No. 1, LSD 4, Section 36-49-1w4. Location is just across the provincial boundary in Alberta, but the major portion of the field is expected to lie on the Saskatchewan side. The show was encountered at 1,925 feet, at approximately the same horizon as the heavy crude in the Wainwright field in Alberta. The crude is around 20 gravity, of asphaltic base, yielding gasoline, distillate, Diesel fuel, lubricating and road oil and particularly suitable for marine and railway fuel oil. Potential production has been estimated 250 to 300 bbls., and plans for systematic drilling of the adjacent area are under consideration.



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Rocky Mountain Area

By
T. R. INGRAM

Two Lance Creek Wells Flow 4,740 Barrels, 24-Hour Test

DENVER, Colo., Feb. 20. — The Bay Petroleum Corp., which operates refineries at Denver, Cheyenne, and McPherson, Kans., will expand its operations to include the production of its own crude requirements, according to an announcement by C. U. Bay, who was elected president at a Denver meeting of directors.

Wyoming completions were confined to Lance Creek, where the Continental Oil Co. No. 3 Apex-4 was rated at 2,500 bbls. per day from the Leo sand, and the Ohio Oil Co. No. 6 Leo made 2,240 bbls. on official 24-hour gauge. New operations include a second test on North Big Hollow by G. R. McConnell; a wildcat on Segment basin, northwest of Casper; location for an outside well to the Leo sand in Lance Creek in the Continental Oil Co. No. 2 Emil Rohlff; and one deepening operation in that field.

Montana had two completions in the Cut Bank field and three new operations in that district and one in Kevin-Sunburst.

NEW MEXICO

Work was started at wildcats in Chaves and Lea counties, featuring field work in southeastern New Mexico the past week. Two of the tests were in the Roswell district, Chaves County. New, Russell & Wood No. 1 Sterrett, NW SE NW Section 29-11-25, about 5 miles southeast of Roswell, had machine on ground. Farther southeast, Tarkenton Brothers were rigging up rotary at No. 1 Peters, 330 feet from the south and 420 feet from the east line of Section 33-11-25.

In eastern Chaves County and about 12 miles northwest of Caprock, Western Minerals, Inc., No. 1 Dow, C SW NW Section 27-10-30, had dug cellar and pits.

The Lea County wildcat was Carper & Taylor No. 1 Taylor, SW SW SW Section 30-16-32, north of the Mitchell pool and about 5 miles northwest of Maljamar production in Eddy County. It was drilling below 308 feet.

Barnsdall Oil Co. purchased state tract No. 8, consisting of the E half of E half, SE SW and SW SE of Section 33-16-36, at the lease sale in Santa Fe last week for $1,525.25. As a result, operations were resumed at the company's No. 1 Humble-State, C NE SE Section 22-16-36, which has been shut down at total depth of 4,997 feet for several weeks. The wildcat is 3 miles northwest of the discovery gas well in the Lovington pool and about the same distance west of the first oil well in the Lovington area. Operators were drilling below 5,144 feet on last report.

Other sales at the Santa Fe auction included the E half SE Section 11-17-36 and SW NW Section 4-17-37, in the Lovington area, bought by Repollo Oil Co. for $4,003.59; and NE quarter Section 29-16-37, northeast of the Lovington pool, bought by Roy G. Barton for $321.66.

Completions of the week in southeastern New Mexico included 10 oil wells, nine in Lea County and one in Eddy County.

Magnolia Petroleum Co. No. 1 Marshall, C SW NW Section 34-21-37, Hardy area, Lea County, topped pay at 3,640 feet, was bottomed at 3,758 feet, and flowed 313 bbls. of oil in 22 hours through quarter-inch choke on 2-inch tubing set at 3,756 feet.

Schermerhorn Oil Co. No. 4 Woolworth, C NE SE Section 28-24-37, one of three new wells in the Jal-Langlie district, found pay at 3,445 feet, total depth 3,530 feet, and flowed 218 bbls. of oil naturally in 24 hours.

North Shore Corp. No. 1 Woolworth, NE NE NW Section 33-24-37, found pay zones at 3,475-80 feet and 3,493-3,548 feet, total depth. It flowed 550 bbls. of oil an hour for six hours through tubing set at 3,500 feet.

The same company's No. 2 Woolworth, SE SE NW Section 33-24-37, flowed 70 bbls. of oil an hour naturally from pay topped at 3,470 feet, total depth 3,534 feet in lime and sand. Flow was through tubing set at 3,500 feet.

Magnolia Petroleum Co. No. 24 State-Bridges, C SW SW Section 13-17-34, one of three completions in the Vacuum field, topped pay at 4,577 feet, total depth 4,700 feet, and flowed 50 bbls. of oil in 7½ hours after perforating at 4,529 and 4,690 feet. Tubing was set at 4,698 feet.

Continental Oil Co. No. 1 State H-34, C SE SE Section 34-17-34, had pay zones at 4,360-90 feet, 4,420-45 feet, 4,590-4,610 feet and 4,625-45 feet, and was bottomed at 4,675 feet. It flowed 37 bbls. of oil an hour through tubing set at 4,650 feet, with gas gauging 658,000 cu. ft. daily.

Same company's No. 4 State H-35, C SE NW Section 35-17-34, flowed at the rate of 6 bbls. of oil an hour, with 6 per cent basic sediment and water and 880000 cu. ft. of gas. It was bottomed at 4,710 feet, with pay topped at 4,480 feet.

In the Baish area, Maljamar Oil & Gas Co. No. 1-B State, C SW SE Section 16-17-32, topped pay at 4,103 feet, drilled to 4,125 feet, total depth, plugged back to 4,115 feet, was acidized with 4,000 gallons and flowed 25 bbls. of oil in 24 hours.

Same company's No. 6 Mitchell, C SW NE Section 20-17-32, flowed 75 bbls. of oil daily after acidizing with 4,000 gallons. Top of pay was 3,685 feet, total depth 4,038 feet.

In Eddy County, Yates and others No. 1 Yates, C NW SW Section 6-18-30, was completed at total depth of 2,874 feet, flowed 420 bbls. of oil in 18 hours through tubing set at 2,719 feet. Pay was topped at 2,806 feet.

Lea County

Barnsdall Oil Co. No. 1 Humble-State, C NE SE Sec. 33-16-36. Drlg. with oil 5,036 ft.
Carper-Taylor No. 1 Taylor (wildcat), SW SW SW Sec. 30-16-32. Drlg. 308 ft.
Continental Oil Co. No. 1-A Sanderson B-14, C N½ NW NW Sec. 14-20-36. W.O.C. 1,443 ft.
Continental Oil Co. No. 5 State H-35, C SW NE Sec. 35-17-34. W.O.C. 300 ft.
Humble O. & R. Co. No. 1-K State, C SE SE Sec. 28-17-35. T.D. 4,640 ft.; prep. to test.
Humble O. & R. Co. No. 2-K State, C NW NE Sec. 32-17-35. Drlg. 4,110 ft.
Humble O. & R. Co. No. 3-K State, C NE SE Sec. 28-17-35. Drk.
Magnolia Pet. Co. No. 1-O State, C NW SW Sec. 33-17-35. Drlg. 1,510 ft.
Magnolia Pet. Co. No. 1-P State, C SW SE Sec. 22-17-35. Drk.
Magnolia Pet. Co. No. 2-J State, C NW SE Sec. 22-17-34. Drlg. 4,435 ft.
Magnolia Pet. Co. No. 25 State-Bridges, C SE NE Sec. 26-17-34. T.D. 4,200 ft.; rng. csg.
Magnolia Pet. Co. No. 26 State-Bridges, C SE SW Sec. 26-17-34. Drlg. 2,690 ft.
Maljamar O. & G. Co. No. 2-B Baish, C NE NE Sec. 27-17-32. T.D. 2,602 ft.; S.D.O.
Maljamar O. & G. Co. No. 1-B Mitchell, C NE SE Sec. 20-17-32. T.D. 3,591 ft.; to D.D.
Ohio Oil Co. No. 1 State-Warn, C SE NE Sec. 33-17-35. Drk.
Ohio Oil Co. No. 2 State-Staplin, C NE SW Sec. 30-17-35. Drlg. 3,375 ft.
Phillips Pet. Co. No. 12 Santa Fe, C NE SW Sec. 28-17-35. T.D. 4,700 ft.; C.O.
Phillips Pet. Co. No. 15 Santa Fe, C NE NE Sec. 28-17-35. T.D. 4,700 ft.; C.O. 4,585 ft.
Phillips Pet. Co. No. 20 Santa Fe, C SW SW Sec. 27-17-35. Drlg. 4,010 ft.
Phillips Pet. Co. No. 21 Santa Fe, C NE NE Sec. 33-17-35. S.D. repairs 4,514 ft.
Phillips Pet. Co. No. 23 Santa Fe, C SW SW Sec. 26-17-35. Drlg. 4,280 ft.
Phillips Pet. Co. No. 24 Santa Fe, C NE NE Sec. 34-17-35. Drlg. 1,735 ft.
Phillips Pet. Co. No. 25 Santa Fe, C NW SE Sec. 30-17-35. Drlg. 4,289 ft.
Phillips Pet. Co. No. 26 Santa Fe, C NE SW Sec. 29-17-35. Drlg. 1,640 ft.
Repollo Oil Co. No. 2 State, Lse. 197, SE NE SE Sec. 6-17-34. T.D. 4,590 ft.; drlg. plug.
Shell Pet. Corp. No. 1-C State, C NE SE Sec. 24-17-34. T.D. 4,733 ft.; swb. and F. 67 B.O. in 18 hrs.
Shell Pet. Corp. No. 1-V State, C NE SE Sec. 21-17-35. Rng. tbg. 4,680 ft.
Standard Oil Co. of Texas No. 3 State, Lse. 3, C NE NW Sec. 32-17s-35. Drlg. 3,900 ft.
Stanolind O. & G. Co. No. 2 State, C SE NW Sec. 1-17-36. W.O.C. 312 ft.
Texas Co. No. 1-T State, C SE NE Sec. 25-17-34. T.D. 4,725 ft.; R.U. pump.
Twin Oil Corp. No. 1-D State, C SW NE Sec. 30-17-35. T.D. 4,700 ft.; R.U. pump.
Fullerton Oil Co. No. 1-A Walker, C SW NW Sec. 18-18-32. Drlg. 2,225 ft.
Phillips Pet. Co. No. 16 Santa Fe, C NW SW Sec. 5-18-35. T.D. 4,750 ft.; C.O. 4,707 ft.
Great Western Prod. Co. No. 2 Bordages, NE SE NW Sec. 33-19-37. Drlg. 2,800 ft. (last report).
Shell Pet. Corp. No. 2 Foster, SE SW SE Sec. 34-19-36. T.D. 3,953 ft.; F. 50 B.F.P.D., 20 per cent water.
Continental Oil Co. No. 2 Britt B-10, C W½ NW SW Sec. 10-20-37. W.O.C. 3,700 ft.
Continental Oil Co. No. 4 Britt B-15, NW SW SW Sec. 15-20-37. W.O.C. 3,745 ft.
Continental Oil Co. No. 3 Sanderson B-14, C E½ SE SW Sec. 14-20-36. Rng. csg. 3,750 ft.
J. M. Rush No. 4 State A-20, NW SE SE Sec. 20-20-37. Loc.
Texas Co. No. 16 Lieu-Lands, C NE SW Sec. 20-20-37. W.O.C. 3,720 ft.
Aloco Oil Co. No. 1 Carson, C SW SE Sec. 28-21-37. T.D. 3,560 ft.; drlg. by wpstk. at 3,483 ft.
Bryant-Drilexco No. 2 State, SE SW SE Sec. 12-21-35. Drlg. 2,641 ft.
Danglade & Clower No. 1 Owen, NW SW SW Sec. 34-21-37. C.&P.
Gulf Oil Corp. No. 7 McCormack, C NE SE Sec. 32-21-37. Drlg. 2,440 ft.
Gulf Oil Corp. No. 2-B Mattern, C SE NE Sec. 31-21-37. R.U.R.
Gulf Oil Corp. No. 4 Ramsey, C SE SE Sec. 35-21-36 Drlg. 2,085 ft.
Francis C. Wilson No. 3 State, NW SE NE Sec. 7-21-35. T.D. 3,855 ft.; P.B. 3,827 ft.; drld. out 3,854 ft. and acdz.; C.O.
Stanolind O. & G. Co. No. 4 Hill, C SW NE Sec. 6-21-37. W.O.C. 1,385 ft.
J. C. Clower No. 1-B Manda, NE NE NW Sec. 28-22-37. T.D. 3,681 ft.; C.O. on bttm.; tstg.
Danglade & Clower No. 1-B Glier, C SE NW Sec. 33-22-37. T.D. 3,691 ft.; swb. 20 B.O.P.D.
Continental Oil Co. No. 4 Lockhart B-1, C W½ SW NE Sec. 1-22-36. Drlg. 3,755 ft.
Continental Oil Co. No. 1 State F-1A, C W½ SE NE Sec. 1-22-35. W.O.C. 1,805 ft.
Continental Oil Co. No. 5 State J-2, C SE SE Sec. 2-22-36. Loc.
Continental Oil Co. No. 5 State E-17, C W½ NW SW Sec. 17-22-36. Drlg. 1,485 ft.
Gulf Oil Corp. No. 3-E Mattern, C NW NW Sec. 12-22-36. R.U.R.
Olean Pet. Co. No. 2 Farrell, SW SE SE Sec. 22-22-37. T.D. 3,757 ft.; tstg.
Skelly Oil Co. No. 7 Baker, C NW NE Sec. 27-22-37. R.U. mch.
Skelly Oil Co. No. 5 Simms, C NW SE Sec. 33-22-37. Drlg.
Texas Co. No. 2-B Fally, C SE SW Sec. 8-22-37. Drlg. 3,665 ft.
Texas Pacific Coal & Oil No. 14-A State, C NW NE Sec. 11-22-36. W.O.C. 365 ft.
Two States Oil Co. No. 4-B Cole, C SW NW Sec. 16-22-37. Drlg. 3,650 ft.
Walter Donnelly No. 1 Davis, C SE NW Sec. 33-23-37. T.D. 3,600 ft.; F. 11 B.O.P.D.; tstg.
Great Western Prod. No. 2-B Leonard, C NW NW Sec. 32-23-37. C.&P.
R. Olson No. 1 Blinebry, C SW SW Sec. 29-23-37. T.D. 3,575 ft.; F. 17 B.O.P.H.; tstg.
Continental Oil Co. No. 4 Jack A-20, C SW NE Sec. 20-24-27. Drlg. 1,800 ft.
Continental Oil Co. No. 2 Jack B-37, C SW NE Sec. 27-24-37. Drlg. 1,480 ft.
Humble O. & R. No. 4 Williams, C NW NW Sec. 34-24-37. R.U.R.
Parker Drlg. Co. No. 3 Erwin, C W½ NE SW Sec. 35-24-37. T.D. 3,460 ft.; F. 10 B.O. in 8 hrs.; est. 3,000,000 cu. ft. gas.
Phillips and Pure No. 5 Woolworth, C SW SE Sec. 33-24-37. C.&P.
Phillips and Pure No. 6 Woolworth, C NE NE Sec. 33-24-37. Drlg. 3,235 ft.
Schermerhorn Oil Co. No. 5 Woolworth, NW SW NE Sec. 28-24-37. Drlg. 3,020 ft.
Schermerhorn Oil Co. No. 6 Woolworth, C SW SE Sec. 28-24-37. R.U.S.T.
Sam Weiner No. 2 Woolworth, SW NW SW Sec. 33-24-37. T.D. 3,290 ft.; W.O.C.
Weir Drlg. Co. No. 3 Woolworth, NE SW SW Sec. 28-24-37. Drlg. 2,400 ft.
Amerada Pet. Co. No. 1-B Stuart, NW SE NE Sec. 22-25-37. R.U.R.
Anderson & Prichard No. 1 Woolworth, NW NE NE Sec. 17-25-37. Loc.
Culbertson & Irwin No. 3 Henry, SW SW SW Sec. 26-25-37. W.O.C. 140 ft.
Gulf Oil Corp. No. 6 Stuart, C NW NW Sec. 11-25-37. Drlg. plug at 3,295 ft.
Italo Pet. Corp. No. 1 Indian B-4, NE NW NW Sec. 4-25-37. Loc.
Italo Pet. Corp. No. 1 Indian Pet. Corp. B-5, NW NE NE Sec. 5-25-37. T.D. 3,537 ft.; W.O.C.
Italo Pet. Corp. No. 2 Indian Pet. Corp. B-5, NE SE NE Sec. 5-25-37. W.O.C. 3,405 ft.
Phillips and Pure No. 2 Woolworth, C SE NE Sec. 9-25-37. Loc.
Richmond Drlg. Co. No. 1-A State, C NW SW Sec. 2-25-37. T.D. 3,446 ft.; shot; C.O. and F. at rate of 730 B.O.P.D. on 2-hr. test; rng. tbg.
Richmond Drlg. Co. No. 2-A State, C SW SW Sec. 2-25-37. Drlg. 1,453 ft.
Sam Weiner No. 3 Smith, C N½ NE SE Sec. 4-25-37. T.D. 3,506 ft.; shot and est. F. 30 B.O. every 2 hrs.

Eddy County

Allen, Fair & Pope No. 1 Snowden, SE NE SE Sec. 36-17-29. R.U. mch.
Aston & Fair, Inc., No. 1 Hudson, C NE NE Sec. 18-17-31. Drlg. 1,950 ft.
Danciger O. & R. Co. No. 1-B Turner, CEL NE SE Sec. 17-17-31. T.D. 3,530 ft.; F. 32 B.O.P.D.; may shoot.
Hammond & Sons No. 1 Ployhar-State, SW SW SE Sec. 16-17-28. Rng. csg. 1,372 ft.
J. O. and J. H. Hammond No. 1 Paris, NE NW NW Sec. 5-17-29. S.D.O. 25 ft.
English & Harmon No. 1 Stogner, C NW SE Sec. 31-17-31. T.D. 4,095 ft.; 350 ft. O. and 2,000 ft. W.I.H.; W.O. csg.
P. B. English No. 1 Saunders, SE SE SE Sec. 13-17-27. T.D. 500 ft.; S.D. reprs.
Flint Prod. Co. No. 1-L Dexter, SE NW SE Sec. 15-17-30. Drlg. 3,365 ft.; 1,500 ft. O.I.H.
Jim E. Hughes No. 2 Brooks, NE SW NE Sec. 19-17-28. Spd. and S.D. reprs.
F. G. Keyes No. 3 Red Gulch, NW NW NE Sec. 16-17-28. Drlg. 1,463 ft.; O.I.H.
Ohio Oil Co. No. 4 State-McCallister, Sec. 25-17-34. W.O.C. 510 ft.
C. S. Powell No. 1 Smith, NW NW NE Sec. 6-17-29. S.D. reprs. 2,333 ft.
Red Lake Oil Co. No. 1 State, NE NE SE Sec. 20-17-28. T.D. 1,916 ft.; to shut off gas at 1,460 ft.
H. J. Steinberger No. 1 Hastie, SE NE SW Sec. 18-17-38. T.D. 555 ft.; shot and bailed 6 B.O.
Adkinson Oil Co. No. 1 Brainard, SE SW SE Sec. 5-18-27. Drlg. 1,375 ft.
Barney Cockburn No. 1 State-Graham, C NE NE Sec. 16-18-31. Drk.
Farmer & Tallmadge No. 1 Hubbell, NE SW Sec. 4-18-25. S.D.O. 380 ft.
Franklin Pet. Corp. No. 1 Ballard, NE NE SE Sec. 1-18-29. Drlg. 2,022 ft.
Franklin Pet. Corp. No. 1 Canfield, C NW NW Sec. 7-18-30. C.&P.
Green Bay Oil Co. No. 1-A Johnson, C SE SE Sec. 11-18-31. Drlg. 3,305 ft.
Harvey E. Yates No. 1 Travis, NE SE SE Sec. 6-18-29. Drlg. 1,610 ft.
Carper Drlg. Co. No. 1 Quillen, C NW NE Sec. 12-19-31. Drlg. 1,725 ft.
Geo. E. Robb No. 1 Cannon, C SW SE Sec. 4-19-30. T.D. 210 ft.; S.D.O.
Geo. E. Robb No. 1 Vandagriff, SW NE Sec. 6-19-31. T.D. 800 ft.; S.D.O.
R. C. Underwood No. 1 Quillen-Bruce, NE NE SE Sec. 4-19-31. T.D. 3,001 ft.; R.U.S.T.
Martin Yates, Jr., No. 1 Bowers, SW SE SE Sec. 31-19-27. T.D. 1,180 ft.; est. 25-40 B.O.P.D.; tstg.
Trojan Oil Co. No. 1 Grant, SW SW NE Sec. 33-20s-25e. S.D.O. 408 ft.
C. F. Ingram No. 1 Page, NE NE SW Sec. 15-21-28. T.D. 2,978 ft.; fsg.
Barnett Oil Dev. Co. No. 1 King, C NW SE Sec. 23-26-30. S.D. reprs. 1,752 ft.

Chaves County

Nay Hightower No. 1 Billingslea, C SW NE Sec. 28-11-30. Rng. csg. 2,875 ft.
E. J. Fisher No. 1 Foster, C NW NW Sec. 7-15-26. T.D. 1,281 ft.; S.D.O.
New, Russell & Wood No. 1 Sterrett (wildcat), NW SE NW Sec. 29-11-25. Mch. on grnd.
Tarkenton Bros. No. 1 Peters, SE SE SE Sec. 33-11-25. R.U.R.
Western Minerals, Inc., No. 1 Dow (wildcat), C SW NW Sec. 27-10-30. Loc.

De Baca County

N. E. Woods No. 1 Jones, C NE SW Sec. 17-4n-20. T.D. 620 ft.; S.D. reprs.
James D. Ward No. 1 Summers, SE NE SW Sec. 15-4n-24e. T.D. 680 ft.; S.D.O.

Roosevelt County

Shell Pet. Corp. No. 1 Harwood, C S½ SE SE Sec. 27-7s-35e. Drlg. 5,641 ft., L.

COLORADO

Adams County

The Derby Dome Oil & Gas Co. has been incorporated under the laws of Colorado to drill a test well to the Hygiene sand at approximately 2,650 feet on the Derby dome, 10 miles northeast of Denver. Location is on the Baxter farm in the C SE SW Section 2-3s-66w, approximately 700 feet southeast of No. 1 Baxter, which was drilled to 4,704 feet by the Oklahoma Oil Co. and predecessors, but which has been idle for more than a year following the accidental death of President L. M. Butler. C. E. Schlemeyer, of Morland, Kans., is president of the new company; A. L. Schlemeyer vice president; and A. M. Schlemeyer, of Denver, is secretary and treasurer. The objectives are sands which had gas shows in No. 1 Baxter at 2,264-70 feet and 2,620-2,830 feet and an oil show at 2,602-20 feet. Contract has been let to R. O. Keyes. Rotary used in drilling No. 1 Baxter will be installed to take the hole to 2,000 feet where it will be standardized. The company has seven-eighths interest in 1,200 acres spread and a 50 per cent interest in the tract upon which the well is located. This acreage was contributed by other interests in consideration of an agreement to drill the test.

Archuleta County

Boone Dev. Co. No. 1 Newton, SE NW SE Sec. 18-33n-1e. S.D. below 800 ft.

Moffat County

Mountain Fuel Supply Co. No. 1 Wilson, NE NW NE Sec. 22-12n-100. Drlg. 2,240 ft.
C. R. Privett No. 1 Sutton, NE NE SW Sec. 1-5n-96w. T.D. 1,145 ft.; fsg.; U.R. lug.
Mackinnie Oil & Drlg. Co. No. 1 Coles, SW SW SE Sec. 1-3n-92w. T.D. 3,075 ft.; prep. to res.

Park County

South Park Oil Co. No. 1 Lemar, NE NE SE Sec. 34-11s-75w. Drlg. 6,795 ft.

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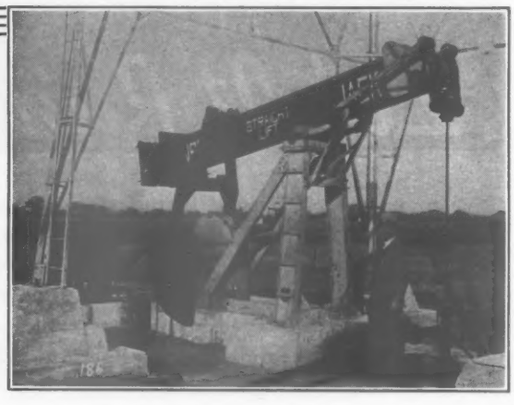

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Prowers County

Continental Oil Co. No. 1 Ruby, C NE NW Sec. 31-21s-44w. Drlg. 5,470 ft.

Pueblo County

C. E. Puckett No. 1 Barber, NW Sec. 35-21s-66w. S.D. 870 ft. for csg.

Eden O. & G. Co. No. 1 Horse Creek, SW SE Sec. 29-19s-64w. T.D. 2,060 ft.; trying to free pipe.

Rio Blanco County

Buford Oil Co. No. 1 Govt., C SW SW Sec. 16-1n-91w. S.D. 3,645 ft. until spring.

WYOMING

Albany County

G. R. McConnell is starting a second test on the North Big Hollow structure in his No. 2 Government three-fourths of a mile south of his No. 1, the discovery well, completed early in 1938 for 25 bbls. per day in the Muddy sand at 890-920 feet.

G. R. McConnell No. 2 Govt., CNL NE SW Sec. 7-15n-75w. Cmt. 10-in. at 163 ft.; drlg. ahead; (first report).

Big Horn County

Clifford S. Johnson No. 1 Johnson, CEL NW NW Sec. 24-51n-93w. Drlg. 460 ft.

Joan Oil Co. No. 1 Howell, NE NW NE Sec. 32-55n 97w. S.D. 2,718 ft.

Carbon County

Sinclair-Wyo. Oil Co. No. 3-A Mahoney Unit, C SW NE Sec. 34-26n-88w. Drlg. r.b. 3,150 ft.

Ohio Oil Co.-California Co. No. 7 Union Pacific-Johnson, CEL NE SW Sec. 23-21n-79w. T.D. 5,836 ft.; P.B. and tstd.; wtr. in Dak. at 5,220-70 ft.; P.B. to Frontier; tstg.

Producers Oil Co. No. 1 Lake Valley, 200 ft. CEL, Sec. 14-20n-88w. S.D. 1,916 ft.

Fremont County

H. Kenyon Burch No. 9 Tribal, C NW NW Sec. 27-3n-1w. Drlg. 1,000 ft.; D.D. from 730 ft.

Lincoln County

H. C. Harris et al No. 1 Govt., SE NW NW Sec. 23-21n-117w. Drlg. 1,355 ft.

Natrona County

The General Petroleum Corp. No. 1 State, on Cole Creek, a mile north of the discovery well, was dry in the Lakota at 8,195-8,213 feet, the producing horizon in the discovery, and will test the Sundance, expected between 8,550 and 8,750 feet, which was not drilled in No. 1.

One new operation was reported in the Richland Corp. No. 1 State, a test to the Wall Creek at 2,100 feet, on Segment basin, 17 miles northwest of Casper.

Richland Corp. No. 1 State, SW NW Sec. 36-36n-81w. R.U.C.T.; (first report).

General Pet. Corp. No. 2 State, NW SE NE Sec. 16-35n-77w. Drk.; foundations run.

General Pet. Corp. No. 1 State, NW NE SE Sec. 16-35n-77w. Drlg. 8,213 ft. in top Morrison.

Niobrara County

The Continental Oil Co. has an excellent completion in the Leo sand in its No. 3 Apex-4, SE SW NW Section 35-36n-65w, Lance Creek field, drilled for the account of the Buck Creek Oil Co., which was rated at 2,500 bbls. per day at a total depth of 5,492 feet. At 5,478 feet it flowed 2,390 bbls. in 24 hours. It had the top of the sand at 5,449 feet and cemented the 7-inch at 5,451 feet. It is a diagonal offset on the northwest to the Ohio Oil Co. No. 6 Leo O.P.C.-16, which was reported a completion last week for 1,580 bbls. naturally in 18 hours. On the official gauge it made 2,240 bbls. in 24 hours.

The Argo Oil Co. No. 9 Elliott, a near completion, has increased from 70 bbls. per day to better than 400 bbls. and is still testing. It is an edge well in the Sundance participating area.

The Adams Oil & Gas Co.-Felmont Corp. No. 1 Baker, an extension of the Leo sand pool on the south, is not yet a completion. The Leo sand was shot with 24 quarts and it is bailing down to test. Before shooting it swabbed 80 bbls. per day. Upon the size of the well when completed probably will depend the drilling of several offsets.

The Minnelusa Oil Corp., independent producer with holdings outside of the unitized area, is reported to be storing 1,000 bbls. per day of Leo crude in the 80,000-bbl. tank on the Novick lease. Offset wells in the unit are taking approximately the same quantity. Allocations in the unitized area are based on crude sales and not well capacity and apply to oil run from the field. Any additional production must be stored. The Standard Oil Co. of Indiana, which has a call on 5,000 bbls. per day of Sundance sand oil for transportation through its trunk lines to the Chicago district, is taking 4,000 bbls. per day during February. The additional 1,000 bbls. per day under its contract can be taken at a later date.

One new operation was reported in the Continental Oil Co. No. 2 Emil Rohlff. This is an outside location on the north for a Leo sand well. Location is one-

fourth of a mile northwest of No. 1 Rohlff, the nearest Sundance producer and half a mile north of the nearest Leo sand well. It will be an important test.

The Minnelusa Oil Corp. is going back into its No. 2 Joss to deepen it from the Sundance sand, where it was completed two years ago at 3,989 feet for 100 bbls. per day, to the Leo sand. It was drilled originally by the J. M. Huber Corp. and was acquired by the Minnelusa company. It is on the western edge of the Sundance sand pool, but well within the Leo sand area.

Continental Oil Co. No. 2 E. Rohlff, NW SE NW Sec. 32-36n-65w. Loc.
Minnelusa Oil Corp. No. 2 Joss, SE NE SW Sec. 6-35n-65w. T.D. 3,989 ft.; R.U.R.; O.W.D.D.
Minnelusa Oil Corp. No. 1 H. & M.-5, NW NE SE Sec. 7-35n-65w. C.&P.
Argo Oil Co. No. 3 Ford, SW SW NW Sec. 33-36n-65w. Drlg. below 4,045 ft.
Ohio Oil Co. No. 1 Leo-O.P.C.-7, NW NW SE Sec. 35-36n-65w. Drlg. 5,644 ft.
Ohio Oil Co. No. 5 Rohlff, 100 ft. E of C E½ Sec. 32-36n-65w. Drlg. 510 ft.; 11¾-in. cmtd. 356 ft.
Continental Oil Co. No. 14 Tom Bell, C NW SW Sec. 34-36n-65w. T.D. 3,960 ft.; 7-in. at 3,941 ft.; W.O.C.
Argo Oil Co. No. 9 Elliott, NW SE SE Sec. 5-35n-65w. T.D. 3,979 ft. in sat. sd.; 7-in. cmtd. 3,931 ft.; tstg.
Fall River Roy. & Prod. Co. No. 1 Govt., CSL SE SE Sec. 35-40n-61w. T.D. 1,000 ft.; fsg. baller.

Sweetwater County

Sinclair-Wyo. Oil Co. No. 81, SW NW NW Sec. 11-26n-90w. T.D. 2,064 ft.; P.B. to 2,034 ft.; swbd. 57 B.O and 400 B.W.P.D.; tstg.
Sinclair-Wyo. Oil Co. No. 82, NE SW SW Sec. 11-26n 90w. Drlg. 1,680 ft.

Uinta County

Stove Creek Oil Co. No. 2 Govt., C SW NW Sec. 26-14n-119w. Drlg. 680 ft.

Weston County

T. R. Ragsdale-Osage Trust No. 3 Govt., C NW SW Sec. 31-42n-60w. Cg. below 2,502 ft.
Lem Johnston No. 1, NW SW Sec. 24-44n-63w. T.D. 1,700 ft.; rng. 10-in. to 1,485 ft.

MONTANA

Glacier County

Cut Bank had two completions and three new operations. The Glacier Production Co. No. 3 O'Brien, C SW SW Section 32-34n-5w, swabbed 145 bbls. first 24 hours from the Cut Bank sand at 2,720-58 feet after running underdigger. It had the Sunburst sand at 2,665-95 feet which made one baller of oil per hour. This was cased off with the 7-inch at 2,722 feet.

The Santa Rita Oil & Gas Co. No. 3 Lander, C S half SE Section 16-35n-6w, a south offset to the No. 1 Lander, the biggest producer in the field, was completed at 2,942 feet and swabbed and flowed 57 bbls. first 24 hours from both the Sunburst and Cut Bank sands. It had the top of the Sunburst at 2,833 feet and from that depth to 2,837 feet, it made 500,000 feet of gas. The 7-inch then was set at 2,837 feet and at 2,837-42 feet it flowed 20 bbls. of oil per day. After going through variegated shale at 2,842-66 feet it had more sand at 2,866-85 feet, which made a small quantity of water. The Cut Bank was at 2,910-37 feet, with slight saturation at 2,927-37 feet. The No. 1 Lander, on the north, showed up for a big producer after it was shot. No. 3 was not shot.

The Yukon Oil Co. will drill its No. 2 Lungren, in North Cut Bank as a south offset to No. 1 Lungren, the discovery well in the Moulton sand, which averaged 85 bbls. per day at 2,566 feet. It was spotted at this location for the purpose of determining the extent of the new sand by progressive drilling out from the discovery. It is a little more than half a mile northwest of the Nadeau Brothers well which was not commercial in either the Moulton or Cut Bank sands.

Yukon Oil Co. No. 2 Lungren, C NE NW Sec. 26-37n-5w. Loc.
Santa Rita Oil & Gas Co. No. 9 Tribal, NE SE NE Sec. 16-35n-6w. R.O.G.
Wm. Hanlon No. 4 All.-128, SW SE NE Sec. 12-32n-6w. R.U.
Glacier Prod. Co. No. 2 Scheuren, C SW SW Sec. 20-33n-5w. Drlg. 560 ft.
Glacier Prod. Co. No. 5 State, C NW NW Sec. 16-35n-5w. Drlg. 2,085 ft.

Petroleum County

H. Clark Rowland No. 1 Brundidge-Mink, SE NW Sec. 35-14n-25e. Drlg. 260 ft.

Teton County

Zodiac Oil Co.-Gulf States Oil Co. No. 1 Kellogg, NE NW NE Sec. 33-28n-5w. S.D. 2,120 ft.
Gulf States Oil-Zodiac Oil Co. No. 1 Coffee-Wallenstein, SW SW SW Sec. 5-27-5w. S.D. 2,525 ft. until spring.

Toole County

Fulton-Commonwealth No. 2 Thompson, SE NW SE Sec. 28-35n-3w. S.D. 160 ft.; (first report).
G. M. Plotke No. 2 Ward, SW cor. Sec. 28-35n-3w. Drlg. 310 ft.
Coolidge & Coolidge No. 3-A State, NW NE NW Sec. 36-36n-2w. S.D. 550 ft.; acct. cold weather.
G. & A. Oil Co. No. 12 Goeddertz, SE NE SW Sec. 23-35n-3w. T.D. 1,680 ft.; ran tbg. to acd. and S.D. acct. weather.
Sid Porter No. 1 Bradley, SE cor. Sec. 3-34n-2w. T.D. 1,415 ft.; fsg.

UTAH

Cane Creek Oil Co. No. 1 Govt., NW SW Sec. 31-26n-21e. Drlg. in salt at 2,845 ft.

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With Anchor

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MARSH GAUGES

Crescent Eagle Oil Co. No. 1 Brendel, SW SE Sec. 4-22s-19e. Drlg. 4,110 ft.

Shoenfelt's Annual Ready

C. E. Shoenfelt's annual resume of Rocky Mountain Oil and Gas Operations for 1938 was released this week by Petroleum Information, Inc., Continental Oil Building, Denver, Colo. The 1938 annual contains 156 pages of text, tables and maps covering all phases of developments in the territory covered and includes an oil and gas pipe line map of the district, a new map of the Lance Creek field based on information developed by the 1938 drilling campaign, maps of most of the structures tested or being drilled, and data on production, prices, refining, transportation, and other factors involved in a complete summary of the industry.

Kansas Fields

(Continued from Page 127)

Same company's No. 6 Martin, C W half NE NW Section 14-24-11w, found Misener sand at 3,797-3,800 feet, total depth 3,801 feet, and made potential of 1,282 bbls. of oil, flowing 125 bbls. in four hours.

E. H. Moore, Inc., No. 5 Johnson, NW SE NE Section 13-24-11w, flowed 132 bbls. of oil in four hours from Misener sand at 3,769-84 feet, making daily potential of 1,555 bbls. It was bottomed at 3,788 feet.

Cowley-Sumner-Sedgwick

Texas Co. No. 7 Hittle, SW NW SE Section 21-31-4, Hittle pool, Cowley County, had largest initial production of any well completed in Kansas the past week. It pumped and flowed 1,182 bbls. of oil in eight hours from Arbuckle lime at 3,264-71 feet, total depth, and made 24 hour potential of 3,546 bbls.

Earl Wakefield No. 1-B Hoover, SE cor. Section 32-33-3, Cowley County, had Bartlesville sand at 3,305-36 feet, total depth, and flowed 12 bbls. of oil in 24 hours.

Ace Oil Co. No. 1 Kirkpatrick, SE SE NW Section 24-25-1e, two locations southwest of production in the Kuske area, Sedgwick County, found Mississippi lime at 3,024 feet, and was dry and abandoned at 3,058 feet, total depth. Mississippi lime production in the Kuske pool is found at around 3,017-20 feet.

Sinclair Prairie Oil Co. No. 10 Kamis, NW NW SW Section 28-31-1w, Wellington field, Sumner County, pumped 131 bbls. of oil in eight hours and was rated potentially at 394 bbls. daily.

Woodson County

C. L. Sheedy No. 1 Fuhlhage, SE NW SW Section 27-25-14, in the Quincy area, Woodson County, had Mississippi lime at 1,548 feet and was dry and abandoned at 1,560 feet.

A Pair of Gas Wells

Skelly Oil Co. No. 1-B Lunt, SW NE NE Section 18-28-11w, Cairo pool, Pratt County, found Viola lime at 4,264-78 feet, total depth, and produced 34,800,000 cu. ft. of gas daily, with 50 pounds back pressure on casing. Shut-in pressure in two hours was 1,250 pounds.

Stevens County Oil & Gas Co. No. 1 Brubaker, C NW Section 34-33-37w, Hugoton field, Stevens County, produced 17,000,000 cu. ft. of gas daily from pay at 2,580-2,777 feet, total depth.

First Reports of New Tests

Skelly Oil Co. No. 1 Carter, C S half SW NE Section 33-14-13w, wildcat in the Letsch district, Russell County, was a cellar.

Ayland Production Co. and others No. 3 Hall Estate, SE SW SW Section 22-14-14w, was a cellar. Skelly Oil Co. No. 1 Goetz, NE SE NW Section 35-15-14w, was moving in rotary. Both are in Russell County.

In Rice County—B. B. & M. Oil Co. No. 1 Willard, NW SW SW Section 6-19-9w, was a cellar. L. A. Ferris No. 1 Purcell, SE NE NW Section 33-19-9, was building rotary rig.

In Barton County—Sinclair Prairie Oil Co. No. 2 Prusa, was location for a new test in the Prusa pool. Same company's No. 2 Seyfert, SW cor. Section 21-16-11w, was building rotary rig.

Cowley County—McKnab & Blair No. 3 Hittle, SW SW NE Section 21-31-4, was rigging up rotary. W. M. McKnab No. 1-A Hittle, SW NE NE Section 21-31-4, was rigging up cable tools. Texas Co. No. 4 Goodrich, NW SW SE Section 21-31-4, was a rotary rig.

Stafford County—Stanolind Oil & Gas Co. No. 8-B Ferris, C N half S half NW Section 23-24-11w, and same company's No. 6-A Volker, C S half S half NE Section 23-24-11w, were locations.

Westgate-Greenland Oil Co. and others No. 1 Wood, SW SW NE Section 36-22-5w, Reno County, was a derrick.

Morgan & Flynn No. 1 Hugert, C W half SW Section 25-18-16w, in Rush County, was rigging up rotary.

I. S. Dustin No. 2 Maxwell, NE SW SW Section 31-24-4, Butler County, was drilling below 90 feet.

Greenwood County—Blue Stem Oil Co. No. 1 Anderson, NW NE SE Section 5-28-11, was shut down for casing at 1,190 feet. Same company's No. 1 Pottorff, SW SW NW Section 16-28-11, was drilling below 370 feet.

Ellsworth County—Gulf Oil Corp. No. 2 Schroeder, NW NW SW Section 20-17-9w, was moving in material. Spencer & Yarnell No. 3 Patzner, SW NW SW Section 31-17-10w, was a location.

Eastern Fields

(Continued from Page 120)

showing of 31,440 cu. ft. of gas. In Harvey district, the Red Jacket Coal Co. is down 2,800 feet in its No. 6.

In Lincoln County, Big Laurel Gas Co. is moving in on the Callaway Plumley farm in Union district and made a location on the Lewis Plumley farm, elevation 740 feet.

On Miller Fork of Beech Fork in Union district, Wayne County, United Fuel Gas Co. made a location on the J. R. Hussey (A. J. Fry and others) No. 4829, elevation 625 feet.

In Pleasants County, R. E. Bills and others have rig up on the Dennis Baker heirs in Jefferson district. In McKim district, Calvin Vincent and others have a rig up on the T. E. Nichols farm. In Lafayette district, the Watson Oil & Gas Co. has a rig up on the F. M. Lamp farm.

In Wetzel County, Null & Moorhead are drilling at 2,750 feet in the No. 3 J. Hostutler Heirs in Church district.

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The maximum in Chain Tong strength. Same design but drop-forged from Alloy and High Tensile steel heat-treated and equipped with Alloy "SUPER-CHAIN." 50% greater strength than regular "Vulcan" Tongs of corresponding size and weight. Eight sizes for 1/8 to 18" pipe.

"VULCAN BOLL-WEEVIL" TONGS

A reversible action Tong for flat pipe work—very efficient in trenches. Changes instantly from "Making-up" to "Breaking-out" without even unhooking chain. Jaws reversible for double life. Each chain proof-tested and certified. Four sizes, 3/4 to 12" pipe.

Also "BOLL-WEEVIL ZEPHYR"

Greater strength with much less weight. Same structural and utility features as regular "Boll-Weevil" but heat-treated and equipped with Alloy "SUPER-CHAIN"—stronger and much lighter, capacity for capacity. Three sizes for 3/4 to 12" pipe.

J. H. WILLIAMS & CO. HEADQUARTERS FOR 275 LAFAYETTE ST., NEW YORK

North Louisiana, Arkansas

By GEORGE WEBER

Tri-State Area Gives Signs of Awakening in Arkansas

SHREVEPORT, La., Feb. 20.—No new developments of importance occurred in the tri-state district of Texas, North Louisiana, and Arkansas during the past week. Field drilling, which has been unusually low recently, is showing an increase in the Magnolia field of South Arkansas, and in the newly opened production area near Vivian, Caddo Parish, North Louisiana.

The two Smackover lime wildcat tests in South Arkansas were still showing disappointing results, and hope for discovery of new lime fields in the two prospects is fading. A third deep test of interest in the Shongaloo field of Webster Parish, Louisiana, tested a deep sand showing gas.

Shreveport Field

A good section of porous saturated Pettit lime was cored in Harry Hanbury No. 1 Sample, a northeast edge test in the Shreveport field. The well encountered the lime at 5,554-60 feet, and a string of 5½-inch casing was set at 5,552 feet. Total depth in shale is 5,566 feet. Another test in the south section of the field is due to core the lime next week, and a total of four rigs are drilling in the field as a whole.

Vivian Activity

A number of new locations in the Vivian sector of Caddo Parish, Louisiana, were staked over the past week, as drilling spurted in the new shallow Woodbine section. Nine rigs are reported in the area at the end of this week. Ten new locations were announced in the past week, bringing the total in the past two weeks to 19.

Results shown in the Burnham Drilling Co. No. 1 Grey, located 330 feet south and east of C Section 34-22-16, may have marked effect on the drilling of many of these locations. The casing in No. 1 Grey was perforated and the well tested, but it did not show any oil in the sand, and the crew was arranging to deepen at the week's end.

The sand which is producing in the west offset to the Burnham test, was cored at 2,471-77 feet. A string of 5½-inch casing was set at 2,481 feet. It was first perforated at 2,472-76 feet with 24 shots, and swabbed dry. After perforating at 2,468-74 feet, the test again swabbed dry. Reperforating at 2,451-54 feet resulted in a salt water test, and the hole will be deepened.

Two other tests in the area are on or approaching the sand, and before the end of this week other wells will have reached the horizon. This is the most active new area in the district, from the standpoint of active drilling rigs.

Shongaloo

The Magnolia Petroleum Co. No. 4 Branton, in the Shongaloo area, deepest current test in the district, tested the Sexton sand. The top of the formation was cored at 9,155 feet. A 23-minute drill stem test made at 9,163-77 feet proved dry, with a show of gas. The test was cored at 9,183-91 feet showing shale recovery, and at latest reports it was coring ahead below 9,200 feet.

Smackover Lime Tests

Attention in South Arkansas was directed to two deep Smackover lime wildcats. The first being drilled by the Shell Petroleum Corp. and Ohio Oil Co. in the Stamps prospect near Lewisville, in Lafayette County, was shut down and the crew is awaiting orders. The wildcat, No. 1 Warren, C SE SE Section 13-16-24, was acidized with 3,000 gallons, and swabbed salt water, with a small show of gas. An electrical survey was run, and the hole was plugged back from an old total depth of 7,420 feet to 7,284 feet where it is shut down.

In Ouachita County, on the Stephens prospect, the Deep Rock Oil Corp. No. 1 Wesson, SE cor. NE Section 23-15-19, continued to show salt water. A string of 5½-inch casing was set last week at 6,038 feet and top of the plug was located at 5,998 feet. The casing was bailed dry and perforated at 5,930-50 feet, in the top of the porous lime section. Early in the week the test was swabbed, showing a trace of oil, and salt water. After shutting in for a day, it was found that the fluid had risen to 5,900 feet, and upon bailing, operators found the top 100 feet consisted of oil, and the remainder salt water.

Magnolia

The Magnolia, or Kerr-Lynn field of Columbia County, South Arkansas' principal field now under development, has two new wells and four other tests being drilled. The W. L. Goldston No. 1 A. C. Garrett cored porous saturated oolitic lime at 7,490-7,510 feet and ran 7-inch casing at 7,500 feet. Southwood Oil Co. No. 1 J. O. Hutcheson cored the lime at 7,553-65 feet and set casing at 7,545 feet. Both wells were brought in late this week.

Production by Pools

Estimated daily gross production, all companies, week ending February 17:

NORTH LOUISIANA

	Bbls.
Bellevue	670
Caddo, light	4,065
Caddo, heavy	2,625
Converse	505
Cotton Valley, heavy	100
Cotton Valley, light	*10,460
Cross Lake	2,975
De Soto and Red River	1,150
Elm Grove	215
Haynesville	3,000
Holly	75
Homer	2,680
Lisbon	4,685
Pleasant Hill	110
Rodessa	28,270
Sarepta-Carterville	†430
Sligo	1,575
Sugar Creek	320
Urania	2,635
Zwolle	2,735
Total North Louisiana	69,280

SOUTH ARKANSAS

Buckner	1,540
Champagnolle	1,900
El Dorado	1,710
Lisbon	250
Magnolia	2,885
Miller County	350
Nevada	615
Rodessa	5,160
Schuler	18,805
Smackover, light	1,915
Smackover, heavy	16,150
Stephens	510
Troy	950
Urbana	1,100
Village	485
Total South Arkansas	53,325

Texas side of Rodessa field 30,560 bbls. daily; *4,165 bbls. is distillate; †150 bbls. is distillate.

Gulf Coast Fields

(Continued from Page 139)

ceive a large scale geophysical campaign as Federal Royalties Co. of Houston was granted a lease for oil and gas exploration on the coastal waters of the state. Under terms of the lease, granted by the Mineral Lease Commission, the company was given six months to complete initial geophysical work, after which the first well must be started within 60 days. The Federal Royalties Co. agreed to pay a bonus of $10,000 and an overriding royalty of $100,000 on each structure which produces oil, and $5 an acre annual rental on blocks of acreage selected for drilling.

Along the Texas Coast, Peyton Brothers No. 3-B Kirby Lumber Co. opened Wilcox (Tertiary) production in the Ace field, Polk County, with an initial flow of 493 bbls. daily through a quarter-inch choke with tubing pressure 475 pounds and casing pressure 1,250 pounds. This test is bottomed at 7,788 feet, and was completed through perforated casing at 7,748-62 feet. This is the third proven field along the Texas Coast in which deeper exploration has uncovered Wilcox sand production.

Approximately 2 miles northeast of the Call field, Newton County, Sun Oil Co. is moving in material for another Wilcox test, No. 1 Peavy Moore Lumber Co., in T.&N.O.R.R. Survey No. 3. Development of Cockfield production in this field has been disappointing, and the progress of the Sun test will be watched with much interest.

In the Goodykoontz area of the Fairbanks field, Harris County, Union Producing Co. has staked location for No. 1 Murphy, in the T. M. Dorsett Survey, approximately 1,750 feet northeast of the discovery well, which was completed as a distillate producer at a depth of about 7,200 feet. This area is about 2 miles northeast of the field proper. Southwest of the field and a half mile northwest of the Satsuma field, H. E. Williams and others are rigging up for No. 1 Leo T. Behne, in the W.C.R.R. Survey No. 2.

On the Brenham dome, Washington County, Virginia Oil Co. No. 2 Pomykal, S. M. Williams Survey, flowed 25 bbls. of 26-gravity oil daily after being completed in a shallow sand at 743-55 feet. The hole is bottomed at 795 feet, and casing was cemented on top of the sand.

On the west side of the Eureka field, Harris County, Jack Frazier has added another producer to the deep sand with the completion of No. 2 Lackner. On an initial gauge the well flowed 519 bbls. daily of which 12 per cent was salt water through a quarter-inch choke from perforated casing at 8,079-85 feet. Location is southwest of the operator's No. 1 Lackner, the discovery well of the deep sand. On the east side of the field, Housh & Thompson No. 1 Helberg is being recompleted after it showed gas, oil and salt water on a production test through perforated casing at 7,687-97 feet.

In the League City field, Galveston County, and about 1,200 feet south of production, George Echols No. 2 Ross-Stewart is flowing into the pits showing wash water and mud while cleaning out from perforated casing at 9,236-60 feet. The hole was drilled to a depth of 9,283 feet and 5½-inch casing was cemented at 9,253 feet. On the west side of the field, Salt Dome Oil Corp. No. 1 Ross-Stewart is preparing to perforating casing at 8,970-85 feet. The test was drilled to a depth of 10,000 feet, and 5½-inch casing was cemented at 9,050 feet.

In Jefferson County location for an interesting wildcat was announced by the Navarro Oil Co. and others for No. 1 Welch in the E. Lopez Survey, southwest of Hamshire. The well is being drilled on a large block assembled by Humble Oil & Refining Co. Protection is held by various major companies.

TEXAS GULF COAST COMPLETIONS IN PROVEN FIELDS

Fort Bend County

Thompson field: Humble Oil & Refining Co. No. 43 Lockwood-Sharp, 3,800 feet, abandoned.

Brazoria County

Hastings field: Humble Oil & Refining Co. No. 2

Lerew, 6,050 feet, 600 bbls., quarter-inch choke. Old Ocean field: Commerce Oil Co. No. 1 Patterson, 10,400 feet, abandoned.

Chambers County

Anahuac field: Humble Oil & Refining Co. No. 21 Tyrell, sand 7,025-91 feet, 637 bbls., quarter-inch choke. Navarro Oil Co. No. 2 Deere, sand 7,076-7,145 feet, 763 bbls., quarter-inch choke.

Harris County

Clear Lake field: Humble Oil & Refining Co. No. 3-C Humble-West, sand 5,897-5,970 feet, 190 bbls., eighth-inch choke. Eureka field: Jack Frazier No. 3 Helberg, perforated casing 7,694-7,704 feet, 638 bbls., quarter-inch choke. Jack Frazier No. 2 Laura Lackner, perforated casing 8,079-85 feet, 519 bbls., quarter-inch choke. Fairbanks field: Housh & Thompson No. 1 Salge, sand 6,815-38 feet, 744 bbls., quarter-inch choke. H. B. Ownby Drilling Co. No. 2 Stephens, sand 6,835-56 feet, 132 bbls., eighth-inch choke. Showers & Moncrief and others No. 2 Reid, sand 6,831-40 feet, 161 bbls., eighth-inch choke. Union Producing Co. No. 2 Whitehead-Rash, perforated casing 6,839-51 feet, 136 bbls., eighth-inch choke. Friendswood field: Humble Oil & Refining Co. No. 29 Beamer, sand 5,698-6,041 feet, 595 bbls., quarter-inch choke. Humble Oil & Refining Co. No. 5-B Humble-West, 6,044 feet, 600 bbls., quarter-inch choke. Humble Oil & Refining Co. No. 6-B Humble-West, sand 5,582-6,042 feet, 395 bbls., quarter-inch choke. Tomball field: Humble Oil & Refining Co. No. 1 J. T. Burge, sand 5,553-62 feet, 429 bbls., quarter-inch choke. Humble Oil & Refining Co. No. 1-C Martens, sand 5,537-61 feet, 23 bbls., quarter-inch choke.

Jackson County

Cordele field: Lewis Production Co. No. 5 Druschel, sand 2,695-2,716 feet, 108 bbls., quarter-inch choke.

Liberty County

Moss Bluff: Crown Central Petroleum Corp. No. 1 Kyle, 653 feet, abandoned.

Matagorda County

Bay City field: Hamman Exploration Co. No. 4 Thompson, sand 9,144-9,275 feet, 223 bbls., quarter-inch choke.

Orange County

Orange field: Union Producing Co. No. 4 Lutcher-Moore, perforated casing 5,522-32 feet, 130 bbls., eighth-inch choke.

Polk County

Segno field: Gulf Oil Corp. No. 3 Quinn, sand 5,189-94½ feet, 280 bbls., quarter-inch choke.

Wharton County

Magnet field: Texas Co. No. 1 Willis, perforated casing 5,536-38 feet, 108 bbls., eighth-inch choke.

Waller County

Katy field: Stanolind Oil & Gas Co. No. 1 Cohee, perforated casing 7,310-60 feet, 40,000,000 cu. ft. of gas, various chokes.

West Texas Fields

(Continued from Page 124)

Pecos Valley, 1,507-1,637 feet, 19 bbls. Peerless Oil & Gas Co. No. 7-A Pecos Valley, 1,507-85 feet, 361 bbls.

Gaines County

Blackstock Oil Co. No. 2 Wasson, 4,920-5,000 feet, 2,273 bbls. Continental Oil Co. No. 2-51 Wasson, 4,940-4,996 feet, 1,512 bbls.

Scurry County

Forest Development Co. No. 1 J. J. Koonsman, dry and abandoned at 5,004 feet.

Ward County

Gulf Oil Corp. No. 118 Hutchins, 2,602-2,780 feet, 899 bbls.; No. 105 O'Brien, 2,769-2,925 feet, 79 bbls.; No. 106 O'Brien, 2,499-2,767 feet, 108 bbls. Humble Oil & Refining Co. No. 4 Winter Garden, location abandoned; No. 5 Winter Garden, location abandoned. Luse & Ice No. 5 Brictson, 2,047-99 feet, 343 bbls.; No. 6 Blair, 2,027-73 feet, 402 bbls. Magnolia Petroleum Co. No. 15-46 Sealy, 2,773-2,850 feet, 254 bbls. Texoil Production Co. No. 6 Allen, 1,965-2,096 feet, 232 bbls.

Winkler County

Magnolia Petroleum Co. No. 206 Walton, 2,815-2,915 feet, 649 bbls.; No. 213 Walton, 3,170-3,267 feet, 611 bbls.; No. 214 Walton, 3,165-3,280 feet, 330 bbls.; No. 215 Walton, 3,175-3,268 feet, 195 bbls. J. R. Sharp No. 5 Walton-Cities Service, 3,357-72 feet, 247 bbls. Stanolind Oil & Gas Co. No. 1 W. A. McCutcheon, location abandoned. W. K. Royalty Co. No. 4-C Walton, 2,910-3,055 feet, 977 bbls.

Yoakum County

Dan Danvers No. 4 J. H. Lynn, 4,880-5,125 feet, 627 bbls. Honolulu Oil and Cascade Oil No. 1-741 Willard, 5,010-5,225 feet, 2,740 bbls. Magnolia Petroleum Co. No. 6 R. Bennett, 5,185-5,250 feet, 778 bbls. Texas Pacific Coal & Oil Co. No. 3 Hall, 5,000-5,150 feet, 2,168 bbls.

WEST CENTRAL TEXAS COMPLETIONS

(24-hour tests)

Brown County

Whiteside & Rogers No. 4 Newton, dry and abandoned at 1,260 feet.

Coleman County

Goodman No. 1 Brown, dry and abandoned at 900 feet.

Comanche County

C. Calloway No. 1 Fountain, dry and abandoned at 690 feet.

Eastland County

V. Gamblin No. 1 Daniels, dry and abandoned at 448 feet. Kleiner & Warren No. 1 Harbin, dry and abandoned at 1,640 feet.

Jones County

B. Fields No. 1 Humphrey, 3,241-55 feet, 404 bbls. Groover-Rose-Farrell No. 1 Swenson, dry and abandoned at 3,271 feet. Ungren & Frazier No. 3 Steffens, 1,897-99 feet, 181 bbls.

Palo Pinto County

Dilbeck and others No. 1 Dalton, dry and abandoned at 1,262 feet.

Shackelford County

Charter Oil & Gas Co. No. 15 Mims, dry and abandoned at 1,736 feet.

PANHANDLE FIELD COMPLETIONS

(24-hour tests)

Carson County

Magnolia Petroleum Co. No. 49 fee 244, 2,990-3,060 feet, 399 bbls. Texoma Oil No. 1-E Jordan, 2,482-2,521 feet, 19,000,000 cu. ft. gas.

Gray County

Kewanee Oil Co. No. 11 Birdie McKinney, 3,140-3,250 feet, 326 bbls. S. & S. Oil Co. No. 2 J. T. Benton, 3,170-3,295 feet, 446 bbls.

Hutchinson County

Gulf Oil Corp. No. 6 E. Cockrell B, 2,997-3,088 feet, 294 bbls.; No. 89 Dial, 2,995-3,082 feet, 257 bbls. Midstates Oil Co. No. 24 Whittenburg A, 2,928-75 feet, 760 bbls.

New York-Penna. Gas Fields

(Continued from Page 145)

Greenwood Township, and New Penn Development Co. and others are drilling at 620 feet on the E. G. Cady farm, Troupsburg Township, other Steuben County operations.

Two of the four Allegany County operations topped the Tully last week. Cunningham Natural Gas Co. got this formation at 4,290 feet on the William Shear No. 2, where it is drilling at 4,575 feet and Belmont Quadrangle Drilling Co. reached the Tully at 4,334 feet on the F. Hilligass No. 3 and is now shut down at 4,643 feet. Both these operations are in Willing Township where Empire Producing Co. is also shut down at

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4,750 feet on the Floyd Wilson No. 2. In Alma Township's lone operation, Belmont Quadrangle Drilling Co. is drilling at 4,375 feet on the C. W. Vossler farm.

New Annex Provided for Houston Oil-World Show

A new steel and concrete annex built adjacent to the Coliseum at Houston, Tex., will provide the required additional space found necessary to accommodate the exhibits at the 1939 Oil-World Exposition from April 24 to 29, inclusive. This new building will have a floor space in excess of 90,000 square feet and its main floor will be a direct extension of the main floor of the $1,337,000 Coliseum completed last year. In addition there will be a ground floor exhibiting area on the same level as the outdoor exhibits. With the original Coliseum building, the new annex and the outdoor spaces adjacent to the buildings, the entire Oil Show will be consolidated into a unit that will enable all visitors to see every exhibit without passing up any display.

The greater facilities have enabled the management to contract more space. Larger exhibiting areas have also been allocated to various exhibitors so a more complete showing of entire lines of equipment can be made. According to Ed Lenzner, general manager, many manufacturers and suppliers are planning to demonstrate tools and machinery in operation and the application of advanced designs under actual field and plant conditions. Much of the outside space will be devoted to demonstration work and to heavier equipment that will be kept in operation to enable the visitor to make a study of the working efficiency.

East Texas Fields

(Continued from Page 136)

Gregg County—Kilgore Area

Byrd-Frost No. 5 J. B. Watson, 3,501-85 feet, 55 bbls. Humble Oil & Refining Co. No. 97-B S. S. Laird, 3,500-3,614 feet, 55 bbls. Patrick Production Co. No. 4-A J. B. Watson, 3,618-47 feet, 56 bbls.

Rusk County—Kilgore Area

General American No. 16 J. E. Sexton, 3,489-3,596 feet, 30 bbls. Gulf Oil Corp. No. 24 W. G. Sexton, 3,640-48 feet, 25 bbls. Shell Petroleum Corp. No. 30 R. Russell, 3,669-3,755 feet, 54 bbls.; No. 31 R. Russell, 3,700-3,803 feet, 56 bbls.

Rusk County—Joiner Area

Blackwell Oil & Gas Co. No. 9 Sayre-Stone, 3,644-49 feet, 60 bbls. Humble Oil & Refining Co. No. 75-A M. and R. Kangerga, 3,676-89 feet, 40 bbls. George B. Ray No. 14 L. J. Pinkston, 3,581-85 feet, 76 bbls.

EAST CENTRAL TEXAS COMPLETIONS

(24-hour tests)

Anderson County

J. J. Minton No. 1 First National Bank, 5,331-5,345 feet, 3,000,000 cu. ft. of gas.

Franklin County

Humble Oil & Refining Co. No. 7 T. L. Loeke, 4,203-69 feet, 316 bbls. Magnolia Petroleum Co. No. 100 S. Maxton, 4,200-91 feet, 423 bbls.

Freestone County

A. J. Willis No. 1 I. and F. Freedman, dry and adandoned at 4,000 feet.

Houston County

Cook & Mayo No. 1 C. A. Walling, dry and abandoned at 6,118 feet.

Southwest Texas Fields

(Continued from Page 133)

Baldwin, perforated casing 5,653-59 feet, 162 bbls., eighth-inch choke. Plymouth Oil Co. No. 3 Kellogg, perforated casing 5,679-81 feet, 172 bbls., eighth-inch choke.

Victoria County

McFaddin field: Barnsdall Oil Co. No. 17 McFaddin, perforated casing 4,380-83 feet, 75 bbls., 17 hours, 9/64-inch choke.

Zapata County

Comitas field: Nordan & Morris No. 12-C Haynes, sand 1,159-80 feet, 42 bbls., pumping. Mirando Valley field: Buffalo Oil Co. No. 5-B Hinnant, sand 1,830-37 feet, 55 bbls., pumping.

Illinois Fields

(Continued from Page 119)

Section 28-1n-1e, underreaming 6-inch casing to 1,980 feet, total depth 2,007 feet. Lincoln and others No. 1 Beneveh, NW cor. SW SE SE Section 9-1n-1e, derrick up.

In St. Clair County, O'Meara and others No. 1 Tarlton, C N half NW SW Section 27-1n-10w, drilling at 218 feet. A. H. Emenheiser, N half NW SW Section 31-1n-8w, drilling at 1,252 feet.

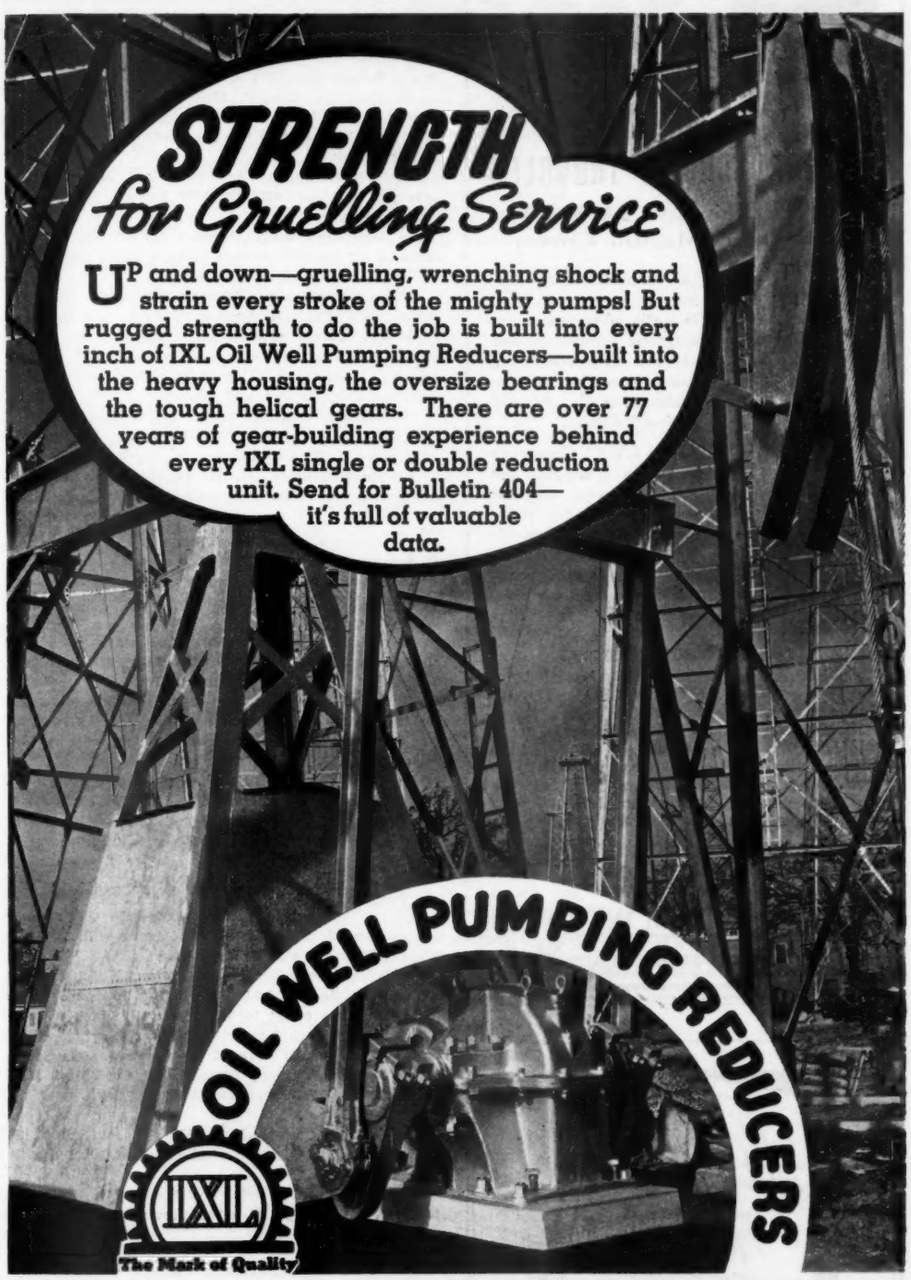
In Clinton County, Claude Bell No. 1 R. T. Athoff, NW SE NE Section 8-1n-3w, total depth 1,036 feet, in sand; salt water in the last 2 feet, plugged back to 1,034 feet, bailed 3 bbls. of oil and bailed down, water broke in, trying to shut it off.

In Jefferson County, V. O. Lewis No. 1 Bates, NE NW NE Section 18-1s-1e, total depth 1,805 feet, will move in rotary tools.

In St. Clair County, Badger Oil Co. No. 1 Reichert, NE cor. NW NE Section 3-1s-10w, Trenton lime at 778 feet, total depth 815 feet, treated with 1,000 gallons of acid, cleaning out.

In Washington County, Smith and others No. 1 Marquard, SE NW SW Section 33-1s-5w, deepened from 900 feet, shut down at 1,026 feet. Taylor Drilling Co. No. 1 Weike, NE SE NW Section 35-2s-3w, drilling at 1,245 feet.

In Jefferson County, Transcontinental Oil Co. No. 1 S. W. Carroll, SE NE SE Section 16-2s-1e, Benoist top at 2,017 feet, drilling at 2,070 feet. Midfield Oil Co. No.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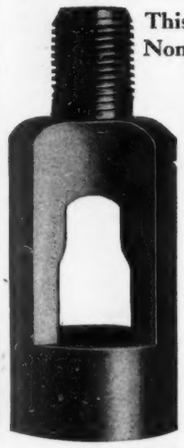

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1 Ervin, SW cor. SE SE Section 24-2s-1e, plugged back to 2,227 feet, acidized with 1,000 gallons, filled up 600 feet with fluid, with only a small showing of oil. Will perforate opposite Bethel sand topped at 2,033 feet. McQueen and others No. 1 Sorensen, NE NE NW Section 5-2s-2e, shut down at 1,473 feet.

In Wayne County, New Penn Development Co. No. 1 Scott, NW NW SE Section 7-2s-9e, moving in rotary tools. Carl Robinson No. 1 Felix, SW SE SE Section 27-2s-8e, pay at 3,389-3,410 feet, shut in to erect tanks.

In Wabash County, Langhorn and others No. 1 Helm, SE SE NW Section 15-3s-14w of second principal meridian, shut down at 2,430 feet, owing to high water. Preston Cochran No. 1 Blankenship, SE SE SW Section 15-3s-3w, drilling at 260 feet.

In Washington County, J. L. Henderson, Jr., No. 1 Kornegger, NE NE NW Section 8-3s-1w, underreaming 6-inch casing to 1,460 feet, total depth 1,489 feet.

In Monroe County, Michael and others No. 1 Faust, C NE NE Section 32-3s-18w, spudded and shut down.

In Wayne County, Iroquois Oil & Gas Co. No. 1 Wingenberger, NE SW SE Section 7-3s-9e, shut down at 300 feet.

In White County, J. W. Pearson and others No. 1 Boltinghouse, CWL SW SW Section 10-4s-14w of second principal meridian, derrick up.

In Hamilton County, Helmerich & Payne No. 1 Hamilton Land Bank, SE SE Section 6-4s-7e, total depth 3,312 feet, bit and two joints of drill pipe in hole, will set whipstock.

In White County, Robinson and others No. 1 Springer, NE cor. SE NW NW Section 18-4s-8e, rigging up rotary.

In Jefferson County, Palacine Oil Co. No. 1 Inland Steel Co., C SE NE Section 29-4s-2e, Glen Dean at 2,237 feet, shut down at 2,263 feet.

In Randolph County, Chlorins and others No. 1 Anderson, NW NE NW Section 12-4s-6w, shut down at 1,340 feet. Doctor Seward No. 1 Behmer, SE SE NE Section 19-4s-7w, shut down at 655 feet. R. T. Pendergast No. 1 Beattie, NW cor. Section 14-5s-5w, set 12½-inch casing at 60 feet, and shut down.

In Franklin County, Adams Oil & Gas Co. No. 1 Old Ben Coal Co., SW SW NE Section 19-5s-2e, old total depth 3,102 feet, moving in rotary to deepen.

In Perry County, G. H. Blankenship No. 1 H. Rheinecker, NW NW NE Section 3-6s-4w, drilling at 400 feet.

In Jackson County, Ben Banner No. 1 Dean, NE NE SE Section 33-7s-3w, pulled 8-inch casing and will ream.

In Saline County, Flaherrty & Waxenberg No. 1 Choisser, NE NW NW Section 5-8s-7e, shut down at 1,100 feet.

In Gallatin County, Bailey and Lucas No. 1 Dr. Harry Logan, SW cor. SE NE NE Section 21-8s-8e, drilling at 2,032 feet. J. Garfield Buell No. 1 Sutton, C S half NW NW Section 5-8s-10e, shut down at 200 feet by high water. Coates and others No. 1 Green, SE cor. Section 16-9s-9e, shut down at 2,396 feet, by high water.

In Union County, B.P.T.U. Syndicate, C S half NE NW Section 14-12s-1w, shut down at 175 feet.

In Massac County, Kahle and others No. 1 Harvick, SW SW SW Section 23-14s-3e, shut down at 3,010 feet.

First Reports on Wildcats

Of the 45 new operations started in the state in the past week in review only 4 were wildcat wells. The wildcats were as follows:

In Coles County, Wheless and others No. 2 Michaels, SE SE NE Section 2-11n-7e, moving in rotary tools. This is a west offset to Wheless well which was not yet a completion but which has been showing oil evidently sufficient to warrant another test.

In Madison County, Penn-Ill. Oil Co. No. 1 Hurlbrink, NE NE NE Section 19-4n-8w, drilling at 545 feet.

In Wabash County, R. S. Hays No. 1 Schutz, SE NW SW Section 7-3s-13w, shut down at 1,321 feet by high water.

In White County, Price and Massey No. 1 Higgins, NW NW NE Section 22-4s-10e, moving in rotary tools.

CENTRAL OHIO

LIMA, Ohio, Feb. 20.—There were nine completions in the Central Ohio area during the past week, four gas wells, three dry holes, one oil well, and one intake well for repressuring project.

Ashland County, Lake Township, Ohio Fuel Gas Co. No. 1 Samuel Mauer, Section 2, found the Clinton sand hard and dry; total depth 3,070 feet.

Cuyahoga County, Mayfield Township, Benedum-Trees Oil Co. No. 1 L. C. Curry, Lot 33, made 33 bbls. of oil and 800,000 cu. ft. of gas the first day after acid treatment in the Newburg sand at 2,778-2,847 feet.

Coshocton County, Pike Township, Rutlege & Mosholder No. 1 Henry M. Rine, Section 5, drilled through the Clinton sand to a depth of 3,040 feet; dry hole.

Knox County, Clay Township, C. A. Davis No. 1 Noah Martin, Section 25, is a gas well good for 370,000 cu. ft., open flow, from the lime at 2,103-10 feet.

Lawrence County, Washington Township, Wiser Oil Co. found the Clinton sand dry from 2,836-50 feet on its test on the Henry Watson tract in Section 12.

Morgan County, York Township, Pure Oil Co. No. 10 R. E. Hughes, Section 33, had a showing of oil and gas in the Berea sand, total depth 1,183 feet. It will be utilized as an intake well on a repressuring project.

Noble County, Jackson Township, H. B. Walker and others No. 1 Elvin T. Wilson, Section 10, is a small Berea gas well, sand 1,715-22 feet.

Wayne County, Congress Township, Ohio Fuel Gas Co. No. 1 Clayton R. Yost, Section 13, gauged 250,000 cu. ft. of gas, open flow, from the Clinton sand, total depth 3,176 feet. Congress Township, Alex McCray No. 2 A. Wholgamuth, Section 13, found a good showing of oil in the lime at 2,835-2,937 feet. It filled up 1,500 feet overnight and will be given an acid treatment.

Washington County, Fairfield Township, Ohio Fuel Gas Co. No. 5 Bartley E. Walsh, Section 1, is a Berea sand gas well with an open flow of 160,000 cu. ft.; sand 1,774-78 feet.

Lima Field

Most of the activity in the northwestern Ohio area centered around the sub-Trenton tests. In Henry County, Harrison Township, Section 24, McAfee and others No. 1 Lucy Damon is drilling around 2,460 feet with considerable water in the hole. The Goodwill Oil & Gas Co. test on the Lester Shinew tract in Section 5, Portage Township, Wood County, is shut down for a cementing job. In Liberty Township, Wood County, Section 15, James Brailey No. 92 D. J. Covey is down 1,900 feet.

G. K. Rogers and others, in Blanchard Township, Putnam County, Section 21, have started drilling their Trenton test on the William Kline tract.

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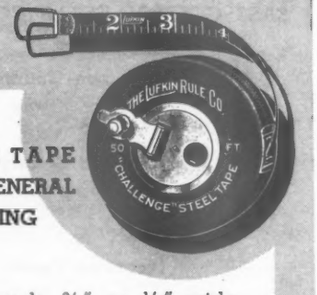

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WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S. T. R.	Depth	Status—
Richfield Oil, No. 1 Tinaquaic, Foxen Can., S. B.	36- 9-32	4,151	sd. sh. drlg.
Barnsdall Oil, No. 5 Magenheimer, Gato Ridge, S. B.	9- 8-32	4,040	br. sh. drlg.
United West. Oil, No. 1 Los Olivos, Santa Barbara	16- 7-30	3,304	idle
Litho Oil, No. 1 R. I. E., Capitan, Santa Barbara	5- 4-30	363	cleaning out
West. Oil Roy., No. 1 Bryce, Carpinteria, Santa Barb.	29- 4-25	1,282	sd. sh. drlg.
T.-O. Oil, No. 2 Mdivani, S. B. Mesa, Santa Barbara	28- 4-27	1,500	pump 12 b.d.
Garvin & Seaman, No. 1 Gauthier, Summerland, S.B.	22- 4-26	1,458	fishing
Merchants Pet., No. 8 Hillside, Sespe, Ventura	1- 4-20	1,715	reaming
Ivers, H. A., No. 14 Kentuck, Sespe, Ventura	1- 4-20	822	will cmt.
St. Louis Oil, No. 1 Creek, Sespe, Ventura	1- 4-20	2,010	O.S. drlg.
Section 20 Oil, No. 1, Sespe, Ventura	20- 5-19	2,540	hd. sd. drlg.
El Rancho Oil, No. 2 Elkins, Shiells Canyon, Ventura	9- 3-19	2,897	sd. sh. drlg.
Continental Oil, No. 10 Grubb, San Miguelito, Vent.	24- 3-24	6,660	O.S. drlg.
C. C. M. Oil, No. 24-B Hobson, Rincon, Ventura	16- 3-24	4,660	O.S. drlg.
Rincon Dev., No. 82-1 State, Rincon, Ventura	tideland	4,150	will redri.
Tide Water A. O., No. 40 V.L.W., Ventura Ave., Vent.	25- 3-23	7,342	O.S. drlg.
Tide Water A. O., No. 14 McGonigle, Vent. Ave., Vent.	23- 3-23	4,671	sd. sh. drlg.
Tide Water A. O., No. 77 Lloyd, Vent. Ave., Vent.	27- 3-23	5,750	deepening
Tide Water A. O., No. 123 Lloyd, Vent. Ave., Vent.	27- 3-23	5,570	cmtd. 4,695
Tide Water A. O., No. 128 Lloyd, Vent. Ave., Vent.	27- 3-23	9,975	flow 1,160 b.d.
Tide Water A. O., No. 134 Lloyd, Vent. Ave., Vent.	27- 3-23	8,339	redrlg. 8,050
Tide Water A. O., No. 8 Hartman, Vent. Ave., Vent.	22- 3-23	4,990	sd. sh. drlg.
Shell Oil, No. 98 Taylor, Ventura Ave., Ventura	21- 3-23	5,326	D.P. froze
Shell Oil, No. 33 Edison, Ventura Ave., Ventura	28- 3-23	5,129	pipe bad
Brit. Amer. Oil, No. 7 Bolsa, Vent. Ave., Ventura	22- 3-23	6,770	redrlg. 6,260
Alliance Pet., No. 3 Hisey, Ventura Ave., Ventura	21- 3-23	4,594	sd. sh. drlg.
Lloyd Corp., No. 2 Dabney, Ventura Ave., Ventura	23- 3-23	8,000	sd. sh. drlg.
Cal. Expl., No. 2 Occidental, Lost Hills, Kern	24-26-20	4,097	sd. sh. drlg.
Belridge Oil, No. 35-26-A, North Belridge, Kern	35-27-20	8,096	br. sh. drlg.
Belridge Oil, No. 26-25, North Belridge, Kern	26-27-20	8,500	tested wet
Belridge Oil, No. 26-39, North Belridge, Kern	26-27-20	6,086	br. sh. drlg.
Belridge Oil, No. 28-2, North Belridge, Kern	28-27-20	8,257	br. sh. drlg.
Tide Water A. O., No. 23-3, North Belridge, Kern	22-27-20	6,592	hd. sh. drlg.
Richfield Oil, No. 3, North Belridge, Kern	22-27-20	5,950	br. sh. drlg.
Amerada Pet., No. 6 Beer, Blackwells Corner, Kern	21-26-19	4,193	br. sh. drlg.
Dilamar Oil, No. 3 Quinn, Jasmin, Kern	15-25-27	320	sd. sh. drlg.
D. B. K., No. 1 Kern, Kern River, Kern	34-28-28	370	sd. sh. drlg.
Helm & Smith, No. 12 Kern, Kern River, Kern	34-28-28	525	O.S. drlg.
Triad Oil, No. 1 A.H.S., Kern River, Kern	19-28-28	1,199	sd. sh. drlg.
Superior Oil, No. 1 Clerico, Magunden, Kern	26-29-28	3,371	dry; abd.
Shell Oil, No. 58-29 Glide, West Mount Poso, Kern	29-27-28	2,321	dry; abd.
Richfield Oil, No. 1 Union, Union Avenue, Kern	5-30-28	9,580	sd. sh. drlg.
O'Reily, F., No. 1 Berree, Edison, Kern	5-30-29	3,960	sd. sh. drlg.
Oils, Inc., No. 1 Cauley, Edison, Kern	16-30-29	4,276	P.B. 4,197
Standard Oil, No. 1 Jewett, Arvin, Kern	16-31-29	6,050	sd. sh. drlg.
Texas Co., No. 35-1, KCL, Fruitvale, Kern	35-28-26	7,450	sd. sh. drlg.
Pacific Southwest Oil, No. 1 Dillon, Fruitvale, Kern	27-29-27	3,491	sd. sh. drlg.
Renner, G. E., No. 2 R.H.L., Sivert, Kern	27-30-30	2,600	idle
Hillview Oil, No. 1 Tejon, Caliente Creek, Kern	11-30-30	2,662	hd. sd. drlg.
Continental Oil, No. 4-A, KCL, Wasco, Kern	8-27-24	12,010	hd. sh. drlg.
Standard Oil, No. 2 Mushrush, Wasco, Kern	7-27-24	11,560	hd. sh. drlg.
Standard Oil, No. 8-2-B, KCL, Wasco, Kern	17-27-24	8,100	hd. sh. drlg.
Cal. Lands, Inc., No. 1 Salisbury, Buttonwillow, Kern	7-29-24	11,506	cmtd. 11,472
General Pet., No. 3 Van Ness, Rio Bravo, Kern	2-29-25	11,330	sd. sh. drlg.
General Pet., No. 1 Caldwell, Rio Bravo, Kern	35-28-25	9,042	fish D.P.
Shell Oil, No. 23-2-A, KCL, Rosedale, Kern	2-29-26	6,630	sd. sh. drlg.
Standard Oil, No. 2 Fleishauer, Greeley, Kern	20-29-26	11,590	tested wet
Standard Oil, No. 11-16, KCL, Greeley, Kern	20-29-26	10,315	gr. sh. drlg.
Standard Oil, No. 11-17, KCL, Greeley, Kern	18-29-26	8,140	gr. sh. drlg.
Standard Oil, No. 12-6, KCL, Greeley, Kern	30-29-26	7,996	zone barren
Standard Oil, No. 1 Elrich, Greeley, Kern	20-29-26	11,655	zone barren
Superior Oil, No. 12, KCL, Greeley, Kern	3-30-26	12,190	sd. sh. drlg.
Shell Oil, No. 6-30-B, KCL, Ten Section, Kern	30-30-26	8,135	sd. sh. drlg.
Shell Oil, No. 61-14-A, KCL, Canal, Kern	14-30-25	8,340	flow 2,000 b.d.
Shell Oil, No. 87-4-B, KCL, Canal, Kern	4-30-25	11,590	sd. sh. drlg.
Ohio Oil, No. 10-E, KCL, Canal, Kern	14-30-25	8,325	tested wet
Richfield Oil Corp., No. 52-32-A, KCL, Tupman, Kern	32-30-25	6,292	sd. sh. drlg.
Union Oil, No. 1-11, KCL, Coles Levee, Kern	11-31-25	6,643	sd. sh. drlg.
Standard Oil, No. 20-1, KCL, Coles Levee, Kern	9-31-25	6,981	sd. sh. drlg.
Ohio Oil, No. 2-F, KCL, Coles Levee, Kern	10-31-25	9,150	sd. sh. drlg.
Honolulu Oil, No. 5-A Vista, Midway-Sunset, Kern	14-32-24	3,024	pump 50 b.d.
Hoyt, Otis, No. 10 Sunset, Midway-Sunset, Kern	7-11-23	955	sd. sh. drlg.
Fried, Julius, No. 1 Fried, Midway-Sunset, Kern	34-32-24	5,035	redrlg. 4,949
National Oil, No. 32 Midway, Midway-Sunset, Kern	35-32-23	1,160	br. sh. drlg.
Standard Oil, No. 7-31 Western, McKittrick, Kern	7-30-22	2,138	O.S. drlg.
Westco Pet., No. 1 West, McKittrick, Kern	34-30-22	5,350	circulating
Hall-Baker Co., No. 1 Williams, McKittrick, Kern	2-30-21	1,335	gas well
Tide Water A. O., No. 2 S.P., Tejon Ranch, Kern	15-11-19	7,326	P.B. 6,790
Petrol Corp., No. 33-5 Reserve, Tejon Ranch, Kern	33-11-19	8,050	basalt; drlg.
Progressive Oil, No. 3, East Coalinga, Fresno	20-19-15	810	cmtd 804
Foreign Oil, No. 6 Annex, West Coalinga, Fresno	6-21-15	2,030	bl. sh. drlg.
Kolinga Refg., No. 2 Hill, West Coalinga, Fresno	14-20-14	840	sd. sh. drlg.
Tyler & Cornwell, No. 4 Tyler, West Coalinga, Fresno	14-20-14	172	sd. sh. drlg.
General Pet., No. 104 Esperanza, W. Coalinga, Fresno	6-20-15	1,192	pump 35 b.d.
Ramsey, W. E., No. 2 Fearon, W. Coalinga, Fresno	18-20-15	4,835	will deepen
Jarvis, L. F., No. 2 Leo, W. Coalinga, Fresno	14-20-14	660	sd. sh. drlg.
Amerada Pet., No. 7-17 S.P.L., North Coalinga, Fresno	17-19-16	6,391	sd. sh. drlg.
Petseahon, No. 31-7-F, S.E. Coalinga, Fresno	7-20-16	3,280	sd. sh. drlg.
Petseahon, No. 35-7-F, S.E. Coalinga, Fresno	7-20-16	5,270	sd. sh. drlg.
Petseahon, No. 22-18-F, S.E. Coalinga, Fresno	18-20-16	2,973	sd. sh. drlg.
Texas Co., No. 1 fee, S.E. Coalinga, Fresno	6-20-16	5,096	sd. sh. drlg.
Standard Oil, No. 71-13-C fee, S.E. Coalinga, Fresno	13-20-15	3,808	sd. sh. drlg.
Superior Oil, No. 3 fee, S.E. Coalinga, Fresno	7-20-16	6,990	sd. sh. drlg.
Superior Oil, No. 4 fee, S.E. Coalinga, Fresno	7-20-16	5,983	sd. sh. drlg.
M. C. A. Drlg., No. 1 Adams, Kreyenhagen, Fresno	33-22-16	1,671	sd. sh. drg.
K. N. D. A., No. 54-24-H, Kettleman North, Fresno	24-21-16	9,650	sd. sh. drlg.
K. N. D. A., No. 6-16-Q, Kettleman North, Kings	16-22-18	8,185	gr. sd. drlg.
K. N. D. A., No. 47-16-Q, Kettleman North, Kings	16-22-18	4,996	sd. sh. drlg.
K. N. D. A., No. 36-18-Q, Kettleman North, Kings	18-22-18	6,280	br. sh. drlg.
K. N. D. A., No. 78-22-Q, Kettleman North, Kings	22-22-18	7,770	O.S. drlg.
Standard Oil, No. 56-1-P, Kettleman North, Kings	1-22-17	7,145	gr. sd. drlg.
Standard Oil, No. 76-7-Q, Kettleman North, Kings	7-22-18	7,090	gr. sd. drlg.
Standard Oil, No. 74-17-Q, Kettleman North, Kings	17-22-18	2,997	sd. sh. drlg.
Standard Oil, No. 81-19-Q, Kettleman North, Kings	19-22-18	2,484	sd. sh. drlg.
Cal. Pet. Prod., No. 1 Irons, Cuyama, San Luis Obispo	19-10-24	1,830	bail mud
Epco, Inc., No. 1 Ajax, Union, San Luis Obispo	27-26-13	4,280	sd. sh. drlg.
Page Pet., No. 1 Brint, Summit, San Luis Obispo	10-11-35	1,935	resume work
Texas Co., No. 1 Arroyo Seco, Greenfield, Monterey	11-19- 5	237	sd. sh. drlg.
S. M. Oil, No. 1 Northern, Oakdale, Stanislaus	34- 1-10	2,418	sd. sh. drlg.

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S. T. R.	Depth	Status—
Antelope Valley Oil, No. 1 Palmdale, Los Angeles	17- 6-12	1,296	sd. sh. drlg.
Texas Co., No. 1 Anderson, Ocean Park, Los Angeles	17- 2-15	7,285	redrlg. 6,811
Rolling Hills Pet., No. 1 Weston, Palos Verdes, L. A.	27- 4-14	5,260	reaming
A. T. Oil, No. 3 Lomita, Torrance, Los Angeles	23- 4-14	5,171	flow 255 b.d.
Alford Oil, No. 12 Lomita, Torrance, Los Angeles	23- 4-14	5,179	sd. sh. drlg.
Anderson Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	5,170	O.S. drlg.
Cinco Oil, No. 1 Woodruff, Torrance, Los Angeles	23- 4-14	3,600	rigged up
Conrell Oil, No. 1 Bush, Torrance, Los Angeles	23- 4-14	2,290	sd. sh. drlg.
Campeet Oil, No. 17-A Kleinmyer, Torrance, L. A.	23- 4-14	3,856	will deepen
Critton & Colvin, No. 1 Clark, Torrance, L. A.	23- 4-14	4,280	sd. sh. drlg.
Cuba Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	5,145	flow 210 b.d.
Elliott, D. W., No. 10 Kettler, Torrance, Los Angeles	23- 4-14	3,874	milling 3,398
Kern Pet., No. 1 Neher, Torrance, Los Angeles	23- 4-14	4,900	O.S. drlg.
Kilgore, S. H., No. 1 Mitchell, Torrance, Los Angeles	23- 4-14	3,980	will deepen
Kovell Oil, No. 1 Deep Hole, Torrance, Los Angeles	23- 4-14	5,167	flow 625 b.d.
Maldum Pet., No. 4 Lomita, Torrance, Los Angeles	23- 4-14	5,171	flow 530 b.d.
Maldum Pet., No. 5 Lomita, Torrance, Los Angeles	23- 4-14	5,165	O.S. drlg.
McCaslin, W. E., No. 1 Springman, Torrance, L. A.	23- 4-14	5,156	O.S. drlg.
Pacific West. Oil, No. 12 Marble, Torrance, L. A.	15- 4-14	3,740	cleaning out
Pettijohn, J. E., No. 2 Marilou, Torrance, Los Angeles	23- 4-14	850	sd. sh. drlg.
Peters Roy. Corp., No. 1 Bass, Torrance, L. A.	23- 4-14	3,171	sd. sh. drlg.
Plymouth Oil, No. 2 Plymouth, Torrance, L. A.	23- 4-14	4,990	sd. sh. drlg.
Rilling & Co., No. 1 H. & H., Torrance, Los Angeles	23- 4-14	3,980	sd. sh. drlg.
Woolner Oil, No. 7 Lomita, Torrance, Los Angeles	23- 4-14	3,750	will deepen
Wilson, Ray, No. 2 Lomita, Torrance, Los Angeles	23- 4-14	5,155	flow 390 b.d.
Whit. S. F. S. Synd., No. 2 Lomita, Torrance, L. A.	23- 4-14	4,910	O.S. drlg.
C. C. M. O. Co., No. 41, Torrance, Los Angeles	15- 4-14	3,740	milling 3,285

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Acd., acidized.
B.O., barrels of oil.
B.P.D., barrels per day.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
B. ck., bottom choke.
Br. sh., brown shale.
B.S., basic sediment.
C.&P., cellar and pits.
Cd. or Crd. cored.
C.D., correct depth.
Cg., coring.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg. or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.S.T., drill stem test.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
L.D.D., later drilled deeper.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., owell drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging back.
P.B.P., pulling or pulled big pipe.
P.L., pipe line.
P.L.O., pipe line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Recvd., recovered.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sdy. sh., sandy shale.
Sdtrk. or St., sidetracking.
S.D.P.L., shut down for pipe line.
S.D.O., or S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing)
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T. ck., top choke.
T.P., tubing pressure.
Tr., tract.
Tstd., tested.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C., or W.O.C.S., waiting on cement to set.
W.O.O., waiting for orders.
W.P., working pressure.
W.S.O., water shutoff.
W.S.S.O.K., water shutoff O.K.
W.S.R. or W.O.S.R., awaiting standard rig.
Wtr., water.

C. C. M. O. Co., No. 51, Torrance, Los Angeles	14-	4-14	4,990	sd. sh. drlg.
C. C. M. O. Co., No. 12 Kettler, Torrance, Los Angeles	14-	4-14	3,825	rigged up
General Pet., No. 13 Poggi, Harbor City, L. A.	30-	4-13	5,080	sd. sh. drlg.
Texas Co., No. 3 Oakley, Harbor City, Los Angeles	30-	4-13	5,188	O.S. drlg.
Union Oil, No. 66 Callender, Dominguez, L. A.	33-	3-13	4,576	sd. sh. drlg.
Union Oil, No. 49 Hellman, Dominguez, L. A.	33-	3-13	9,188	sd. sh. drlg.
Shell Oil, No. 12 Reyes, Dominguez, Los Angeles	33-	3-13	3,912	sd. sh. drlg.
Shell Oil, No. 97 Reyes, Dominguez, Los Angeles	33-	3-13	8,850	sd. sh. drlg.
Barnsdall Oil, No. 12 Rosecrans, Rosecrans, L. A.	20-	3-13	4,990	sd. sh. drlg.
Bankline Oil, No. 2 Kirby, Rosecrans, Los Angeles	20-	3-13	7,298	sd. sh. drlg.
Metcalfe Oil, No. 1 Bradford, Rosecrans, L. A.	20-	3-13	3,671	sd. sh. drlg.
Union Oil, No. 28 Rosecrans, Rosecrans, L. A.	19-	3-13	7,730	sd. sh. drlg.
Universal Consd., No. 10 Trust, Rosecrans, L. A.	18-	3-13	5,992	sd. sh. drlg.
Isco Pet., No. 2 Abel, Rosecrans, Los Angeles	19-	3-13	7,737	O.S. drlg.
Superior Oil, No. 12 Maxwell, Rosecrans, L. A.	19-	3-13	7,696	swab water
Howard Oil, No. 1 H.O., Rosecrans, Los Angeles	20-	3-13	2,570	sd. sh. drlg.
Basin Oil, No. 4 Club, Potrero, Los Angeles	34-	2-14	3,703	sd. sh. drlg.
Barnsdall Oil, No. 5 R. S. F., Newhall, Los Angeles	26-	4-17	5,994	sd. sh. drlg.
Standard Oil, No. 1 Ward, Aliso Canyon, Los Angeles	27-	3-16	1,281	hd. sh. drlg.
Tide Water A. O., No. 2 Porter, Aliso Canyon, L. A.	27-	3-16	1,293	hd. sh. drlg.
Union Oil, No. 1-27 Orcutt, Aliso Canyon, L. A.	27-	3-16	1,085	sd. sh. drlg.
Mangrum & Page, No. 1 Lintz, Newhall, Los Angeles	4-	3-15	220	sd. sh. drlg.
General Pet., No. 22 Harbor, Wilmington, L. A.	2-	5-13	4,100	flow 675 b.d.
General Pet., No. 32 Harbor, Wilmington, L. A.	2-	5-13	4,000	sd. sh. drlg.
General Pet., No. 12 S.P., Wilmington, L. A.	2-	5-13	4,105	flow 702 b.d.
F. A. Pet., No. 1 Franco, Wilmington, L. A.	29-	4-13	3,725	sd. sh. drlg.
McCloskey, E. F., No. 1 Padreson, Wilmington, L. A.	32-	4-13	3,662	O.S. drlg.
Richfield Oil, No. 23 P.D., Wilmington, L. A.	2-	5-13	2,722	sd. sh. drlg.
Royalty Ser. Corp., No. 8-A Nelson, Wilmington, L. A.	4-	5-13	3,393	O.S. drlg.
Sonwell Oil, No. 5 Harbor, Wilmington, L. A.	2-	5-13	2,550	sd. sh. drlg.
Signal O. & G., No. 1, L.B.-Allen, Wilmington, L. A.	2-	5-13	1,678	sd. sh. drlg.
Signal O. & G., No. 1-D, L.B.-U.P., Wilmington, L. A.	3-	5-13	2,099	sd. sh. drlg.
Union Pacific R. R., No. 99, Wilmington, L. A.	4-	5-13	3,535	flow 270 b.d.
Union Pacific R. R., No. 102, Wilmington, L. A.	34-	4-13	2,910	sd. sh. drlg.
Union Pacific R. R., No. 107, Wilmington, L. A.	3-	5-13	2,098	cleaning out
Union Pacific R. R., No. 108, Wilmington, L. A.	4-	5-13	1,894	sd. sh. drlg.
Union Pacific R. R., No. 13-E, Wilmington, L. A.	34-	4-13	2,999	sd. sh. drlg.
Universal Consd., No. 7 Newport, Wilmington, L. A.	2-	5-13	3,647	O.S. drlg.
Grady, R. T., No. 1 Associates, San Pedro, L. A.	23-	5-14	614	cmtd. 415
Ridge Oil, No. 1 Club, Montebello, Los Angeles	3-	2-12	715	cleaning out
Olympic Refining, No. 1 Smith, Montebello, L. A.	2-	2-12	7,136	tested wet
St. Helens Pet., No. 30 Monterey, Montebello, L. A.	2-	2-12	6,526	sd. sh. drlg.
St. Helens Pet., No. 4 Mulholland, Montebello, L. A.	2-	2-12	5,792	sd. sh. drlg.
Standard Oil, No. 2 Braun, Montebello, L. A.	2-	2-12	6,694	O.S. drlg.
Standard Oil, No. 4 Braun, Montebello, L. A.	2-	2-12	6,727	flow 970 b.d.
Standard Oil, No. 5 Braun, Montebello, L. A.	2-	2-12	5,171	sd. sh. drlg.
Standard Oil, No. 2 Kaufman, Montebello, L. A.	2-	2-12	6,563	sd. sh. drlg.
Standard Oil, No. 2 Harvey, Montebello, L. A.	2-	2-12	5,780	will deepen
Standard Oil, No. 4 Harvey, Montebello, L. A.	2-	2-12	6,620	sd. sh. drlg.
Union Oil, No. 1 Calkins, Montebello, L. A.	2-	2-12	7,160	tested wet
Union Oil, No. 4 Paul Howard, Montebello, L. A.	2-	2-12	6,405	sd. sh. drlg.
Union Oil, No. 3 Wilcox, Montebello, Los Angeles	2-	2-12	6,613	sd. sh. drlg.
Union Oil, No. 30 La Merced, Montebello, Los Angeles	1-	2-12	6,648	sd. sh. drlg.
Stanley Oil, No. 1 Montebello, Montebello, L. A.	2-	2-12	4,890	sd. sh. drlg.
Pongratz Oil, No. 1 Newmark, Montebello, L. A.	3-	2-12	6,710	O.S. drlg.
Texas Co., No. 5 Mulholland, Montebello, L. A.	2-	2-12	4,891	sd. sh. drlg.
Herley-Kelly, Inc., No. 2 Burke, Montebello, L. A.	2-	2-12	6,650	sd. sh. drg.
H. & C. Oil, No. 1 Joyce, Whittier, Los Angeles	22-	2-11	3,360	sd. sh. drlg.
Texas Co., No. 1-13-A Smith, Anaheim, Orange	8-	4-10	8,085	sd. sh. drlg.
Brea Canyon Oil, No. 49 Brea, Brea Canyon, Orange	2-	3-10	4,891	C.P. 4,655
Shell Oil, No. 20 Orange, Brea Canyon, Orange	2-	3-10	7,185	flow 85 b.d.
Battersby, J. M., No. 1 Associates, Carmenita, Orange	21-	3-11	8,950	P.B. 7,500
Southwest Expl., No. 7 State, Hunt. Beach, Orange	3-	6-11	4,315	pump 230 b.d.
Southwest Expl., No. 8 State, Hunt. Beach, Orange	4-	6-11	3,900	sd. sh. drlg.
Southwest Expl., No. 14 State, Hunt. Beach, Orange	10-	6-11	5,140	O.S. drlg.
Dragon Oil, No. 1 Jauman, Huntington Beach, Orange	36-	5-11	4,380	sd. sh. drlg.
Texas Co., No. 10 Brown, Huntington Beach, Orange	11-	6-11	3,145	sd. sh. drlg.
Wilshire Oil, No. 2 H.B., Huntington Beach, Orange	10-	6-11	4,329	reaming
Wilshire Oil, No. 15 H.B., Huntington Beach, Orange	10-	6-11	4,362	reaming
Patos Drlg., No. 1 Graham, Sunset Beach, Orange	21-	5-11	4,830	hd. sh. drlg.
Continental Oil, No. 41 Bixby, Seal Beach, Orange	11-	5-12	4,171	sd. sh. drlg.
Dauphin Dev., No. 1 Irwin, Ponto, San Diego	16-12-	4	812	idle

KANSAS

Week Ending February 18 (Descriptions are East unless marked otherwise)

Barber County

Barbara Oil Co. No. 1 Wilson, C SE Sec. 17-33-13. Drlg. 3,315 ft.

Olson Oil Co. No. 1 Coffman, C NW NE Sec. 25-31-12w. Drlg. 2,095 ft.

Barton County

Amerada Pet. Co. No. 1 Kruckenberger, C NE NE Sec. 14-19-15w. Lans. 3,260 ft.; Arb. 3,572 ft.; T.D. 3,632 ft.; pmp. 44 B.O. in 8 hrs.; pot. 132 B.O.; comp.

Central Pet. and Vernon O. & G. No. 1 Miller, SE SW SE Sec. 17-16-13w. Drlg. 685 ft.

Gulf Oil No. 1 Louis, C N½ NW SW Sec. 2-20-12w. Arb. 3,347 ft.; T.D. 3,362 ft.; S.S.O.; to acdz.

Long & Johnson No. 1 Eveleigh, SW SW NE Sec. 3-18-14w. Lans. 3,100 ft.; Arb. 3,338 ft.; T.D. 3,367 ft.; P. 66 B. O. in 8 hrs.; pot. 197 B.O.

Paul Martin No. 1-A Feltes, NW SW SE Sec. 8-16-12w. Drlg. 1,910 ft.

I. W. Murfin No. 1 Birzer, NE SW Sec. 21-19-11w. Drlg. 2,515 ft.

Sinclair Prairie No. 1-A Pichner, NE SE SE Sec. 10-16-11w. Arb. 3,344 ft.; T.D. 3,371 ft.; P.B. 3,245 ft.; plgd. at 3,103 ft. and filled 525 ft. F.I.H.: 50% blk. oil; D.&A.

Butler County

Bowland & McCoy No. 1 Frankson, SE SW Sec. 2-29-6. S.D. 165 ft.

Hay, Hall & Table-Mesa Oil Co. No. 1 Ferrell, SW NW NE Sec. 28-28-8. Drlg. 750 ft.

Higgens & Pierce No. 1-A Shrieves, NE NW SE Sec. 2-26-4. T.D. 1,000 ft.; D. &A.

Cowley County

Brewer & Blair No. 1 Miller, NE NW NE Sec. 13-32-5. Bart. sd. 2,925 ft.; Miss 3,068 ft.; T.D. 3,075 ft.; D.&A.

Ben Gralapp et al No. 1-A Clark, NW NW NE Sec. 11-31-3e. T.D. 3,248 ft.; P.B. 3,000 ft.

Mead Bros. No. 1 Julian, NE SE NW Sec. 16-33-3. Drlg. 2,300 ft.

Phillips Pet. Co. No. 1 Bernard, SE SE NE Sec. 19-33-6. Fsg. blt 3,073 ft.

Dickinson County

Franks et al No. 1 Huffman, NW NW SW Sec. 11-13-1. Drlg. 1,960 ft.

Ellis County

Bridgeport No. 1 Froelich, CWL SW Sec. 34-12-16w. Drlg. 2,755 ft.

Darby Pet. No. 1 Peavey, NW NW NE Sec. 24-11-18w. T.D. 3,456 ft.; swb. 110 B.O. in 15 hrs.

Graham County

Continental Oil Co. No. 1 Drumm Comm. Co., SE SE NE Sec. 16-9-21w. Lans. 3,390 ft.; Arb. 3,679-94 ft.; T.D. 3,702 ft.; swb. 12 B.O.P.H.

Continental Oil Co. No. 1 Putnam Inv. Co., CWL SW Sec. 3-9-21w. Drlg. 3,-050 ft.

Greenwood County

Hancock et al No. 1 Rousch, C S½ SE NW Sec. 8-28-13. T.D. 1,530 ft.; S.D.

Harvey County

Lanahan Drlg. Co. No. 1 Lagree, SE SE Sec. 4-23-3w. T.D. 280 ft.; T.A.

Kingman County

Duwe & Farris No. 1 Kimminau, NE NW SW Sec. 12-30-9w. Set pkr. 4,450 ft.; 100,000 cu. ft. gas; Simp. 4,635 ft.; Arb. 4,758 ft.; T.D. 4,799 ft.; D.&A.

Leavenworth County

John Hardaway No. 1 Scheller, SW SE SW Sec. 30-10-22. S.D. 345 ft.

McPherson County

Marylyn Oil No. 1 Dixon, NW NE NW Sec. 7-19-2w. T.D. 3,018 ft.; acd.; P.& F. 36 B.O. in 24 hrs.

Phillips Pet. Co. No. 1 Esqu, CEL W½ NE Sec. 7-21-4w. Drlg.

Marion County

Johnson et al No. 1-A Miltz, SW SW SW Sec. 24-17-4. T.D. 2,485 ft.; shot and C.O.; H.F.W.

Vickers Pet. No. 1 Sutphin, SW SE SW Sec. 30-22-4. Drlg. 2,132 ft.

Mead County

Pacific Midwest Oil No. 1 Rexford, NE SE SW Sec. 8-30-29w. S.D. 1,435 ft.

Osage County

J. M. Edwards No. 1 Detrick (O.W.D.D.), C NW SE Sec. 21-14-15. O.T.D. 1,200 ft.; S.D. 1,200 ft.

Ottawa County

Babcock Oil No. 1 Copeman, NW NW Sec. 18-10-2w. Miss. 2,835 ft.; H.F.W. 3,302-10 ft.; S.D. for csg. 3,480 ft.

Pratt County

Champlin Ref. Co. No. 1 Elliott, SW NE Sec. 26-27-14w. Fsg. 4,857 ft.

Reno County

Barnsdall Oil Co. No. 1 Krehbiel, NE NE NE Sec. 18-25-5w. Lans. 2,735 ft.; drlg. 3,505 ft.

Rice County

McPherson Drlg. Co. No. 1 Cramm, SE SE SW Sec. 15-19-9w. Drlg.

Spurrier & Bruce No. 1 Cary, NE NW NW Sec. 30-18-8w. O.W.D.D.; O.T.D. 1,530 ft.; S.D. 1,680 ft.

Rooks County

Broadview Oil No. 1 Beardsmore, NW SE SW Sec. 2-9-16w. Drlg. 535 ft.

Phillips Pet. Co. No. 1 Tanzey, C NW SW Sec. 25-8-18w. Arb. 3,418-3,423 ft.; T.D. 3,424 ft.; acd. and swb. 21 B.F.

Russell County

Phil-Han No. 1 Weimeister, SW Sec. 13 14-13w. Top pay 2,655 ft.; perf. and acd. and swb. ½ B.O.P.H.; to P.B.

R. H. Shields No. 1-A Gross, CSL SW SE Sec. 5-15-13w. Lans. 2,929 ft.; T.D. 2,-976 ft.; P.B. 2,900 ft.; bailed 10 B.O. and 10 B.W.; S.D.O.

Saline County

Central States Oil Co. No. 1 Crawford, NW SW NE Sec. 26-13-3w. Drlg. 1,100 ft

Sedgwick County

Century Pet. Co. No. 1 Wilke, SW SE SW Sec. 1-29-2. Rng. csg. 700 ft.

Frank Hudson et al No. 1 Fulton, NE SE Sec. 35-28-1e. S.D. 2,356 ft.

Shawnee County

W. M. McKnab No. 1 Fritz, SW SE NW Sec. 4-12-14. Drlg. 480 ft.

Stafford County

Continental Oil No. 1 Russell, SW SW NE Sec. 13-25-13w. Arb. 4,024 ft.; cd. 4,038-41 ft. and rec. slight sat.

Stanolind O. & G. Co. No. 1 Curtis, SE cor. Sec. 31-21-12w. Viola 3,544 ft.; Arb. 3,638 ft.; R.U.S.T. 3,640 ft.

Virginia Drlg. Co. No. 1 Schlockter-meyer, SE NW Sec. 7-21-11w. Arb. 3,-347 ft.; set 7-in. 3,457 ft.

Wabaunsee County

Scheu & Tague et al No. 1 Aye, NW SW NW Sec. 10-12-8. S.D. 488 ft.

Woodson County

Roby et al No. 1 Meairs, SW SW NW Sec. 21-25-14. S.D. 400 ft .

M. J. Trott No. 1 Abbott, NW NE NE Sec. 21-25-14e. Drlg. 1,325 ft.

NEBRASKA

Pawnee County

Blazer & McClure et al No. 1 Allen, NW NE SW Sec. 16-1n-10e. Bart. sd. 40 ft.; Miss. L. 149 ft.; Arb. 789 ft.; T.D. 801 ft.; lost hole and shot off csg.; P.B. to 450 ft.; 100 gal. acd. and 1,000 gal. acd.; C.O.

Richardson County

H. C. Stephens and E. Uhri No. 1 Harlow, C SE NE Sec. 32-1n-13e. O.W.D. D.; S.D. 780 ft.

Hitchcock County

C. L. Price No. 1 Carter, SE NE SW Sec. 35-2n-32w. Drlg. 2,300 ft.

Adams County

Prunty Prod. Co. No. 1 Katzburg, 2 mi. S of Hastings; 4,000-ft. test. Drlg. 3,-635 ft.

OKLAHOMA

Week Ending February 18

NORTHERN OKLAHOMA

Caddo County

Texas Co. No. 1 Smith, C NE NW Sec. 2-5-12w. T.D. 2,556 ft.; S.D.O.

Cleveland County

Burke-Greis No. 1 Alberts, SE SW NW Sec. 19-7-1w. Hunton 6,885 ft.; Viola 7,320 ft.; Dense 7,390 ft.; 2nd Wlx. 7,-710-35 ft., T.D.; ran Schlm.; S.D.O.

English Drlg. Co. No. 1 Rice, C NE NE Sec. 3-10-2w. Drlg. 960 ft.

Harper, Turner et al No. 1 Taylor, SE NE NW Sec. 23-8-2w. Woodford 7,090 ft.; drlg. 7,158 ft.

Nels-Burrton No. 1 Hirsch, NW NW NE Sec. 17-9-2w. O.W.P.B.; O.T.D. 7,692 ft.; T.D. 7,695 ft.; perf. 7,525-40 ft. in sd.; swbg. F., mostly wtr.

Comanche County

Ker-Lyn Oil Co. No. 1 Laging, C NE SW Sec. 30-4-9w. Drlg. 3,390 ft.

Mid Night Oil No. 1 Howe, NW NW NE Sec. 30-2-13w. O.W.D.D.; O.T.D. 703 ft.; fsg. 746 ft.

Ed Parsons No. 1 Stephens, C NW SW Sec. 29-4-9w. Drlg. 200 ft.

Garfield County

Champlin Ref. Co. No. 1 Allen, SE SE SE Sec. 26-24-8w. W.O.C. 6,385 ft.

Hughes Drlg. Co. No. 1 Meisner, C NE NW Sec. 10-20-4w. Viola 5,705 ft.; T.D. 5,755 ft.; R.U.S.T.

Garvin County

H. R. Hollenbach et al No. 1 Butterly, NE NE SE Sec. 22-1n-1e. 3,218,000 cu. ft. gas; drlg. 3,205 ft.; S.D.; repairs.

Ker-Lyn Oil Co. No. 1 Butterly, NE NE SE Sec. 22-1-1. O.W.D.D.; O.T.D. 3,-205 ft.; to D.D.

Grady County

Carter Oil Co. et al No. 1 Smith C-58, C SE SW Sec. 26-5-8w. S.S.O. 5.329-58 ft.; S.O. 5,433 ft.; cd. 5,964-76 ft.; rec. sh.; cd. 6,351-76 ft.; rec. hd. sd.; T.D. 6,613 ft.; set 9-in. csg. 6,602 ft.; W. O.C.

Hughes County

Skelton et al No. 1 Gilmore, C N½ NE SE Sec. 7-5-9. Drlg. 302 ft.

Kay County

Cooper Drlg. Co. No. 1 Caughlin, SE NE SW Sec. 30-25-1. Drlg. 135 ft.

Crawford No. 1 Boehl, SE SE NW Sec. 34-27-2w. T.D. 1,040 ft.; fsg.

C. C. Nye No. 1 Wolfenbarger, SW NW SW Sec. 16-27-4. T.D. 3,201 ft., sd.

Kaw Oil Co. No. 1 Wolfenbarger, NW NW SE Sec. 9-27-4. T.D. 60 ft.; S.D.; rprs.

Kingfisher County

Ace Gutowsky No. 1 Lankford, NE NE SE Sec. 34-17-6w. Drlg. 5,775 ft.

Kiowa County

C. J. Hagerling No. 1 Kimray, SW SW NW Sec. 36-5-18w. T.D. 500 ft.; fsg. blt.

R. L. Emerson No. 1 Handcock, SE SE NE Sec. 26-6-15w. S.D. 520 ft.; mch. moved out.

Lincoln County

Fields & Nagle No. 1 Black, SE SE SE Sec. 31-16-6; O.W.D.D. T.D. 3,980 ft.; P. 10 B.O. and wtr. in 3 hrs.; tstg.

Muskogee County

Heydrick No. 1 Paschall, NE SE NW Sec. 22-13-19. S.D. 1,446 ft.

Okfuskee County

Carter & Hight No. 1 Rogers, SW SW SW Sec. 6-13-8. T.D. 2,850 ft.; P.B. 2,-510 ft.; recmtd.

I. T. I. O. No. 1 Palmer, NE SE NW Sec. 5-10-9. Drlg. 1,455 ft.

Okmulgee County

Jim Wise Drlg. Co. No. 1 Morrow, SW NW NE Sec. 16-15-13. 3,000,000 cu. ft. gas 1,930-38 ft.; decreased to 1,000,000 cu. ft. at 1,985 ft.; T.D. 1,985 ft.; S.D.

Pawnee County

Ed Kelly No. 1 Hill, SW SW SE Sec. 1-21-5. T.D. 1,780 ft.; S.D.

Payne County

Comail Oil Co. No. 1 Curran, SE SE SE Sec. 21-19-6. Drlg. 3,063 ft.

Starr O. & G. Co. No. 1 Georgia, SE SW NE Sec. 35-18-4. 1st Wlx. 4,051 ft.; 2d 4,083 ft.; T.D. 4,123 ft.; Skinner sd. 3,463-93 ft.; P.B. 3,494 ft.; est. 2,000,-000 cu. ft. gas; tstg.

Pittsburg County

Phillips Pet. Co. No. 1 Hubacker, C NW NE Sec. 11-7-5. Drlg. 4,510 ft.

Pontotoc County

H. Z. Moore No. 1 Payne, SE NW SE Sec. 16-4-4. T.D. 997 ft.; S.S.O.; S.D.

Union Dev. Co. No. 1-A Abbott, SW NW NE Sec. 34-3-6. S.D. 4,100 ft.

Pottawatomie County

Grimes et al No. 1 Dye, NW NW SE Sec. 2-5-5. Drlg. 2,890 ft.

J. E. Trigg No. 1 Truesdell, SW SW SE Sec. 21-7-5. Drlg. 2,240 ft.
Wood Oil Co. No. 1 Peters, SW SE NW Sec. 28-8-4. Wlx. 3,540 ft.; dolo. 4,365 ft.; perf. 4,560 ft.; perf.; S.&F. 125 B. O. in 24 hrs.; perf.&S. 130 B.O. in 24 hrs.; treated twice and tstg.

Seminole County

Atlantic Ref. Co. No. 1 Atkinson, NW NW SW Sec. 17-6-6. Misener 3,697 ft.; Viola 3,718 ft.; T.D. 4,023 ft.; P.B. 3,819 ft.; W.O.C.
Lesslie Rogers No. 1 Kidd, NE SW SE Sec. 33-10-8. T.D. 200 ft.; abd.
H. S. Moss No. 1 Leachman, C N½ SE NE Sec. 34-10-6. Drlg. 4,233 ft.
W. C. Wood No. 1 Aldridge, SW NW NE Sec. 5-8-8. T.D. 1,910 ft.; H.F.W.; S. D.O.

Sequoyah County

Thompson Brs. No. 1 Ruby, NW NW NE Sec. 30-12-22. Drlg. 970 ft.

Stephens County

Phillips Pet. Co. No. 1 Culbertson, NW NW SE Sec. 4-1-5w. Drlg. 4,516 ft.

Texas County

Republic Nat. Gas Co. No. 1 Dulabohn, C Sec. 21-6n-15ecm. Drlg. 2,365 ft.
Republic Nat. Gas Co. No. 1 Judd, CSL SW Sec. 24-6n-15ecm. T.D. 2,870 ft.; gas 7,100,000 cu. ft.

Washita County

Continental Oil Co. No. 1 Proctor C NW Sec. 28-10-20w. T.D. 10,195 ft.; rmg. 9,859 ft.
L. B. McWhirter No. 1 fee, NW SW SW Sec. 34-8-19w. T.D. 2,190 ft.; S.D.

SOUTHERN OKLAHOMA

Carter County

Pure Oil Co. No. 1 Noble, NE SE Sec. 35-3s-1e. Woodford 4,289 ft.; Hunton 4,638 ft.; Viola 5,014 ft.; drlg. 5,276 ft.

Choctaw County

Clyde Ross et al No. 1 Hardy, SE SE NW Sec. 21-7s-15. S.D. 1,406 ft.

Jefferson County

H. W. Weir No. 1 Carmichael, NE NE SW Sec. 23-7s-7w. W.O.C. 102 ft.

Marshall County

Hughes et al No. 1 Vittitto, C NE SE Sec. 11-5s-4e. O.W.D.D.; O.T.D. 7,100 ft.: S.D.O.

Murray County

A. G. Carter No. 1 Vensonite, 1,170 ft. W and 150 ft. S, Sec. 34-1s-2e. Drlg. 650 ft.

Tillman County

Smith No. 2 Hammel, NE NW NW Sec. 6-5s-15w. T.D. 2,380 ft.; recd. D.P. and S.D.

LOUISIANA

N. LOUISIANA WILDCATS

Bienville Parish

Ark. La. Gas Co. No. 2 Gayoso, 660 ft. SW cor. SE Sec. 14-16-10. T. Tr. Pk. 5,432 ft.; D.S.T. 5,796-5,805 ft.; tstd. dry in 26 min.; set 8⅝-in. csg. 6,300 ft.; T.D. 6,324 ft.; W.O.C.

Bossier Parish

Premier Inv. Co. No. 1 McDade, SE SW NE Sec. 28-19-11. T.D. 2,384 ft.; acd. with 1,000 gal.; csg. seat gave away; hole full S.W.; 5½-in. csg. 2,342 ft.; pmpg. 5 B.O.P.D. and 25 bbls. S.W.; fsg. for C.T. 2,472 ft.

Caddo Parish

P. T. Alexander No. 1 fee, NE cor. SE Sec. 1-20-16. Drlg. sh. 1,410 ft.
R. E. Allison No. 3 Ellerbe, NE cor. Sec. 28-18-14. Loc.
Rhoda Armstrong No. 2 Henderson, SW cor. Sec. 27-22-16. R.U.
Claude Bagley No. 1 Crystal fee, NE SW Sec. 24-21-16. Set 6-in. csg. 996 ft.; T.D. 1,003 ft.; tstd. S.W.; S.D.; W.O.
R. L. Bauman No. 1 Dorian, SE cor. NE Sec. 34-18-14. Drlg. sh.&L. 4,915 ft.
Mose Browning and E. D. Holcomb, Jr., No. 1 Henderson, SW cor. Sec. 27-22-16. Cg. ahd. 2,472 ft.
J. M. Buckler No. 2 Stiles, NE cor. Sec. 17-21-16. Drlg. sd. 940 ft.
Burnham Drlg. Co. No. 1 Gray, 330 ft. S and E, C Sec. 34-22-16. 12½-in. csg. 100 ft.; set 5½-in. csg. 2,481 ft.; perf. and swbd. dry at 2,472-76 ft. and 2,468-74 ft.; tstd. S.W. in perf. 2,451-54 ft.; T. sd. (cor.) 2,471-77 ft.; arng. dpn.
Carney et al No. 3 Hart, SE NW Sec. 21-21-16. Set 8-in. csg. 1,563 ft.; tstd. S.O.; acdzd. with 3,000 gal.; tstg.
Paul Cooper No. 2 Stiles, SW SE Sec. 28-21-16. Set 6-in. csg. 1,542 ft.; used 1,500 gal. acd. and tstd. dry; tstd. S.O. 1,851 ft.; drlg. to 1,977 ft.; tstd. S.W.; W.O.
Cryer & Davis No. 1 Crystal fee, S and W, C Sec. 25-21-16. 10-in. csg. 70 ft.; oil sd. 2,274-76 ft.; T.D. 2,276 ft.
Driscoll Drlg. Co. No. 1 Muslow, NE cor. Sec. 9-20-15. Rng. csg. 1,310 ft.
Claude Ferguson No. 5 Lawhon, NW cor. Sec. 7-24-15. R.U.
Harry Fotiades No. 1 Tomlinson, C NE NW Sec. 35-18-14. Drlg. 50 ft.
Don George No. 1 Henderson, SW cor. Sec. 27-22-16. R.U.
H. C. Prod. Co. No. 1 Kinnebrew & Ratcliff, NE cor. Sec. 5-19-16. D.S.T. 2,253 ft.; S.W.; 7-in. csg. 1,497 ft.; P.B. 1,680 ft.; O.T.D. 2,253 ft.; acdzd. with 2,000 gal.; tstg.
Harry Hanbury No. 1 Sample, C SW SE Sec. 23-18-14. Por. L. 5,554-60 ft.; set 5½-in. csg. 5,552 ft.; T.D., sh. 5,566 ft.; W.O.C.
A. R. Hancock No. 4 Helpman, Sec. 16-21-16. R.U.
Hurricane Pet. Corp. No. 1-C Chandler, C SW SE Sec. 34-18-14. Jnkd. at 1,256 ft.; skd. over and began second hole; drlg. 1,755 ft.
Johnston, Flanigan & Williams No. 1 Henderson, SE SW Sec. 27-22-16. Drlg. sh. 1,410 ft.
C. M. Jones No. 1 Henderson, SW cor. Sec. 27-22-16. R.U.
La. Oil Prod. Co. No. 15-B Muslow, Sec. 4-20-15. Set 7-in. csg. with 4½-ft. perf. on bttm. at 2,148 ft.; W.O.S.R.
Wm. C. Leisk No. 1 Sinclair, NW SE Sec. 26-18-14. 13⅜-in. csg. 294 ft.; drlg. sh. &L. 3,305 ft.
Ben Levy No. 1 Crystal fee, SW cor. Sec. 25-21-16. Set 6-in. 1,350 ft.; tstd. dry 1,650 ft.; W.O.
C. D. Loe No. 1 Meyer, SE cor. Sec. 33-18-14. T. Pettit 5,592 ft.; O.T.D. 5,631 ft.; swbd. O.&S.W.; resqzd. all perf. and set plug 5,605 ft.; tstd. dry; reperf. 5,592-5,602 ft. and ripped csg. 5,592-5,602 ft. and swbd. S.O.; fsg. swb.
Magnolia Pet. Co. No. 5 Caddo Lvr. Bd., NE cor. Sec. 7-20-15. T.D. 1,562 ft.; acdzd. with 3,000 gal.; comp.; pmpg. 5 B.P.D.; 1,562 ft.
Magnolia Pet. Co. No. 6 Caddo Lv. Bd., NW cor. Sec. 7-20-15. Set 7-in. csg. 1,335 ft.; used 3,000 gal. acd.; tstg.; T.D. 1,565 ft.
F. W. Martin Co. No. 1 Browning, NE cor. Sec. 33-22-16. Drlg. 2,200 ft.
Oblinger & Ritter No. 1 Boisseau, SE cor. Sec. 34-21-16. R.U.
S. H. Riggs and C. C. Gilger No. 1 Browning, SE cor. NW SW Sec. 27-22-16. Drlg. 750 ft.
S. H. Riggs and C. C. Gilger No. 1 W. D. Browning, NW cor. NE SW Sec. 27-22-16. R.U.
Southern Star Pet. Corp. No. 1 Muslow, SE NW Sec. 17-20-15. Pmpd. S.W.; O.T.D. 1,698 ft.; S.D. 2,150 ft.
J. O. Whittington No. 1 Grayson, C SE SE Sec. 30-19-15. Set 9⅝-in. csg. 2,200 ft.; T. Massive anhy. 4,434 ft.; base 4,695 ft.; drlg. 4,780 ft.
R. W. Williams No. 3 Ark. Fuel, SW cor. NW SW Sec. 25-21-16. R.U.

Caldwell Parish

G. W. Ziegen et al No. 15 Cent. La. Lbr. Co., 1,650 ft. S, 330 ft. E, NW cor. Sec. 32-15-2e. S.D. 1,653 ft.

Claiborne Parish

E. T. Oakes et al No. 2 Kilgore, C NW SE Sec. 28-21-5. Hd. to slightly por. L. 5,294-5,303 ft.; 5½-in. csg. 5,287 ft.; plg. tbg. to reset 5,324 ft.

De Soto Parish

S. S. Alexander No. 1-A Stoll, Sec. 5-12-16. Set 7-in. csg. 2,705 ft.; acd. with 3,000 gal. and tstd. est. 2,000,000 cu.ft. gas; 400 lbs.; D.S.T. 2,984-3,046 ft.; tstg. 165 ft. mud cut with oil, 35 min.; set short string 5-in. csg. on bttm.; T.D. 3,145 ft.; perf. 3,000-44 ft.; 2,500 ft. O.I.H.; set tbg. and test with pmp.
Paul Miller No. 2 Jal Drlg. Co., NE Sec. 5-11-11. Set 7-in. csg. 4,038 ft.; perf. 3,901-14 ft.; C.I.; W.O. ga.; R.P. 1,400 lbs.; O.T.D. 4,205 ft.; perf. csg. 3,901-14 ft.; C.I.; W.O. ga.; R.P. 1,400 lbs.

La Salle Parish

Alfred Black, Tr., No. 1 Wright, Sec. 35-10-1e. R.U.
Placid Oil Co. No. 7 La. Central Lbr. Co., 270 ft. SL, 96 ft. WL, Sec. 13-10-4e. R.U. and S.D.; high wtr.
Stovall Drlg. Co. No. 4-B Russell, NW cor. Sec. 25-10-1e. S.D. 1,054 ft.; high wtr.
G. C. Walsenham No. 1 Dean, NW cor. SE Sec. 23-9-1e. 6-in. csg. 1,595 ft.; tstd. S.W.; S.O.; sd. 1,602-05 ft.; T.D. 1,654 ft.; W.O.

Natchitoches Parish

Jack Lent et al No. 1 Whatley, SW cor. Sec. 17-10-10. S.O.&G. reported at 1,490-1,516 ft.; T.D. 1,516 ft.; D.S.T. 1,470-56 ft.; tstd. dry in 20 min.; did not set csg.; D.S.T. 2,069-96 ft.; rec. 180 ft. mud and sl.; S.O. and 900 ft. S.W in 15 min.; cd. sh. 3,462-72 ft.; S.D.; rig rep. 3,472 ft.

Red River Parish

Crow Drlg. Co. No. 1 Crichton, 990 ft. S and E, C Sec. 17-13-10. Set 4½-in csg. 2,540 ft.; T.D. 2,562 ft.; perf. 2,505-39 ft.; W.O.S.R.
J. C. Prine No. 3 Haynes, SW cor. Sec. 20-13-10. 5¾-in. csg. 2,510 ft.; D.D. 2,560 ft.; W.O.S.R.
H. B. Schumacher No. 1 Crichton, SW cor. NW Sec. 18 13-10. Set 8-in. csg. 1,065 ft.; blg. to test 1,450 ft.
D. J. Simmons et al No. 1 Richardson, NE cor. Sec. 24-13-11. Set 5½-in. csg. 2,500 ft.; T.D.; W.O.C.

Sabine Parish

Geo. Ellis No. 1 Walker, 500 ft. NW cor. NW SE Sec. 8-4-12. Set 12½-in. csg. 276 ft.; W.O.C.
Earl F. Fox No. 1 Cook Ld. Co., SW cor. SE NW Sec. 1-9-12; O.W.W.O. O.T.D. 3,655 ft.; arng. dpn. 3,655 ft.
A. B. House No. 1 Sabine, NW NW Sec. 23-7-14. 8-in. csg. 2,134 ft.; used 1,000 gal. acd.; tstd. dry; cond. mud 3,642 ft.; arng. set 7-in. 3,500 ft.; T.D 3,642 ft.
Hunter Co. No. 8 Bowman Hicks, C NE NW Sec. 13-7-13. Set 6-in. csg. 2,126 ft.; tstd. dry; D.&A. 2,568 ft.
LeGrande & Brown No. 1 Tatum, NE cor. NW NE Sec. 17-8-13. Tstd. dry 2,130 ft.; tstd. S.G.: acd. with 1,000 gal.; tstd. dry 2,340 ft.; did not acd.; tstd. S.W.; S.O. 2,340 ft.; 500 ft. O. .H.; used 3,000 gal. acd.; tstd. S.O. 2,340 ft.; will set short string 4-in. csg. 2,340 ft.; W.O.S.R.; 800 ft. O.I.H.
H. L. Nutting No. 1 Williams, SW cor. Sec. 13-7-11. T.D. 3,130 ft.; used 3,000 gal. acd.; swbg. S.W. 2,860 ft.; will P. B. 2,755 ft.; tstd. S.W.; P.B. 2,730 ft.; acdz.; tstd. S.W.; S.O. 2,730 ft.; S.D.: T.D. 2,730 ft.
Major Oil Co. No. 1 Long Bell, SW cor. SW SE Sec. 1-7-13. 7-in. csg. 2,142 ft.; T.D. 2,576 ft.; tstg. small S.O.
W. L. Posey et al No. 3 Hale, NW cor. NW Sec. 12-7-13. 7-in. csg. 2,090 ft.; comp.; 100 B.P.D.; T.D. 2,515 ft.
C. H. Smith No. 1 Sabine Lbr. Co., NE cor. NW NW Sec. 9-7-13. Set 10-in. csg. 66 ft.
Sutton Zwolle Oil Co. No. 2 Bowman Hicks, NW cor. SW NW Sec. 6-7-13. Drlg. sh. 350 ft.
Sutton Zwolle Oil Co. No. 2 Sabine, NW cor. NE NW Sec. 23-7-14. T. chk. 2,128 ft.; b. chk. rk. 2,670 ft.; drlg. sh. &L. 3,735 ft.
Voline Oil Co. No. 1 Sabine, NE cor. NW NW Sec. 23-7-14. Reported S.O. in sdy. L. 3,760-3,805 ft.; set 6⅝-in. csg. 3,760 ft.; T.D. 3,805 ft.; tstd. dry 3,805 ft.; S.W. broke in; believe csg. seat gave way; tstd. formation 3,805-3,976 ft.; dry; W.O. 3,976 ft.

Tensas Parish

H. V. Schumacher No. 4 Mound Plantation, Sec. 29-11-12e. S.D. 2,950 ft.

Webster Parish

R. L. Fisher et al No. 1 S. P. D. Coyle, 660 ft. N and 1,880 ft. E of SW cor. Sec. 23-21-10. Holly. sd. 5,544-59 ft. and 5,809-16 ft.; set 5½-in. csg. 5,782 ft.: T.D. 5,998 ft.; tstd. S.G.; swbd. S.O.& G.; flwg. 10 B.P.D. by hds. with input gas; tstg.
Hunt Oil Co. No. 4 Bodcaw-Stewart, 2,155 ft. N and 660 ft. E. SW cor. Sec. 34-21-10. Holly. sd. 5,821-47 ft.; set 9⅝-in. csg. 5,802 ft.; tstd. S.O.&G. in Hollwy. sd.; drlg. sh.&L. 7,626 ft.
Hunt Oil Co. No. 5 Bodcaw-Stewart, NW cor. NE Sec. 33-21-10. Hollwy. sd. 5,734-63 ft. and 5,885-95 ft., oil; set 9⅝-in. csg. 5,938 ft.; W.O.C.; T.D. 5,941 ft.
Hunt Oil Co. and Stanolind O. & G. Co. No. 1 Coffee-Webster Inv. Co. Unit, C NE NW Sec. 36-31-10. 13⅜-in. csg. 677 ft.; no Holly. sd.; set 9⅝-in. csg. 5,780 ft.; drlg. sh.&sd. 7,673 ft.
Hunt Oil Co. No. 5 Webb, 75 ft. W, C SE NE Sec. 14-21-16. Hollwy. sd. (oil) 5,740-63 ft.; comp.; 804 B.P.D.; ⅝-in. ck.; T.P. 750 lbs.; C.P. 1,200 lbs.; 9⅝-in. csg. 5,728 ft.; T.D. 5,961 ft.
Magnolia Pet. Co. No. 4 Branton, NE cor. Sec. 6-22-9. 9⅝-in. csg. 5,933 ft.; T. lower Marine 7,750 ft.; T. Bodcaw sd. 8,193 ft.; T. Davis 8,442 ft.; show some heavy oil at 8,450 ft.; set 7-in. csg. 9,137 ft.; T. Sexton sd. 9,155 ft.; cg. 9,179 ft.; D.S.T. 9,163-77 ft.; tstd. dry; S.G. in 23 min.
Magnolia Pet. Co. No. 1 Cox, C NW SW Sec. 15-21-10. Set 13⅜-in. csg. 847 ft.; 9⅝-in. csg. 5,868 ft.; drlg. sd.&sh. 6,646 ft.
Magnolia Pet. Co. and Ohio Oil Co. No. 1 Coyle-Hodges Unit, SW cor. NW Sec. 21-21-10. Drlg. sd.&sh. 5,935 ft.
Magnolia Pet. Co. No. 1 Roseberry Unit, 20 ft. N and W, C SE Sec. 29-23-9. Set 13⅜-in. csg. 887 ft.; T. Pettit L. 5,725 ft.; S.O. 5,764-66 ft.; T. Tr. Pk. 5,900 ft.; set 9⅝-in. csg. 5,962 ft.; T. Lwr. Marine 7,850 ft.; drlg. sh. 8,145 ft.
Ohio Oil Co. No. 5 Bodcaw Acct. 4, NW SE Sec. 13-21-10. O.W.W.O.; killed to recomp.; S.D. 7,774 ft.
Ohio Oil Co. No. 1 Merritt, NE cor. Sec. 14-21-10. Set 13⅜-in. csg. 806 ft.; drlg. anhy.&sh. 4,535 ft.
Oliphant Oil Corp. No. 1-A Hodges, C NW NE Sec. 3-20-10. Top Tr. Pk. 5,995 ft.; no Holl. sd.; set 9⅝-in. csg. 5,810 ft.; T. Lwr. Marine 8,090 ft.; drlg. sh. 8,295 ft.
Stanolind O. & G. Co. and W. Delaney No. 1 Pardee-Coffee Unit, C NE Sec. 36-21-10. T. Tr. Pk. 5,932 ft.; no Holloway sd.; set 9⅝-in. csg. 5,955 ft.; drlg. sh.&sd. 8,068 ft.
Union Prod. Co. No. 1 Walker Unit, 50 ft. S, C SE Sec. 30-18-8. Set 9⅝-in. csg. 6,490 ft.; T. Pettit 6,665 ft.; T. Tr. Pk. 6,910 ft.; drlg. rd. sdy. sh. 7,457 ft.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co. No. 1 Franciol, Sec. 67-12s-3e. Drk.

Bancroft—Beauregard Parish

Republic Prod. Co. No. 6 Columbia Ld. & Tbr. Co., Sec. 15-6s-13w. R.U.
Republic Prod. Co. No. 4 Lutcher Moore Lbr. Co., Sec. 16-6s-13w. Drk.
Republic Prod. Co. No. 5 Lutcher Moore Lbr. Co., Sec. 15-6s-13w. T.D. 7,394 ft.; 7-in. csg. 7,394 ft.
Republic Prod. Co. No. 1 Louis Whitman, Sec. 15-6s-13w. T.D. 7,344 ft.; P.B.; sdtrkd.; drlg. sh.&L. 6,934 ft.; no report.

Bateman Lake—St. Mary Parish

Texas Co. No. 2 State-Bateman Lake, Sec. 21-16s-12e. R.U.
Texas Co. No. 2 Wax Bayou Co., Sec. 21-16s-12e. Loc.

Baton Rouge—East Baton Rouge Parish

Geo. Helis et al No. 1 McInnis, Sec. 36-8s-1w. Loc.
Wm. Helis No. 5 Duplantier, Sec. 65-7s-1w. Top sd. 6,451 ft.; T.D. 6,475 ft.; 7-in. csg. 6,459 ft.; flwg. est. 150 B.F. P.D.; 5/32-in. ck.

Bay St. Elaine—Terrebonne Parish

Texas Co. No. 2 L.L.&E., Bay St. Elaine, Sec. 18-22s-18e. T.D. 6,500- ft.; 9⅝-in. csg. 6,020 ft.
Texas Co. No. 2-B State-Bay, Sec. 13-22s-17e. 9⅝-in. csg. 6,512 ft.; T.D. 6,682 ft.; sdy. sh.; O.S.

Bayou Blue—Iberville Parish

Humble O. & R. Co. No. 1 Wilbert & Sons Lbr. Co., Sec. 74-9s-10e. T.D. 1,869 ft., as run csg.
Humble O. & R. Co. No. 11 Wilberts, Sec. 67-9s-11e. Loc.

Bayou Choctaw—West Baton Rouge

La. Crusader No. 5 Schwing, Sec. 29-8s-11e. 9⅝-in. csg. 2,250 ft.; T.D. 4,755 ft.; P.B. 4,200 ft.; sdtrkd. 4,214 ft.; T.D. 7,878 ft.; P.B. 7,530 ft.; stk. D.S. P.B. 5,800 ft.; sdtrkd.; T.D. 5,890 ft.; P.B. 5,200 ft.; drlg. sh. 8,150 ft.
La. Crusader No. 6 Schwing, Sec. 29-8s-11e. Drlg. sh. 7,842 ft.

Bayou des Allemands—St. Charles Parish

Amerada Pet. Corp. No. 3 St. Charles Ld. Co., Sec. 13-15s-20e. Drlg. sh. 7,482 ft.
Amerada Pet. Corp. No. 4 St. Charles Ld. Co., Sec. 13-15s-2e. Loc.

Caillou Island—Terrebonne Parish

Texas Co. No. 29 State, Sec. 17-23s-20e. Rig.

Cameron Meadows—Cameron

Burton-Sutton Oil Co. No. 26 Sch. Ld., Sec. 16-14s-13w. T.D. 2,465 ft.; 13⅜-in. csg. 2,465 ft.; T.D. 6,564 ft.; P.B.; sdtrkd.; drlg. sh.&L. 5,930 ft.

Chacahoula—La Fourche Parish

Sun Oil Co. No. 5 Dibert, Stark & Brown Cypress Co., Sec. 70-15s-15e. 16-in. csg. 110 ft.; 10¾-in. csg. 1,865 ft.; T.D. 6,055 ft.; stk. D.S.
Sun Oil Co. No. 4 Delbert Stark and Brown Cypress Co., Sec. 70-15s-15e. T.D. 7,794 ft.; P.B. 6,764 ft.; sdtrkd.; drlg. sh. 7,017 ft.

Charenton—St. Mary Parish

Commerce Oil Co. No. 1 T. Brulation, Sec. 19-13s-10e. Loc.
Edwards & Aber No. 2 Blanchard, Sec. 21-13s-9e. T.D. 1,148 ft.; 5½-in. csg. 1,141 ft.; tstd. S.W.; P.B. 1,132 ft.; perf. csg. 1,125-32 ft.; W.O.S.R.
Kinsley Oil, Inc., No. 1-B Hertel, Sec. 30-13s-9e. Loc.
Pan American Prod. Co. No. 1 Achee, Sec. 21-13s-9e. Loc.
Pan American Prod. Co. No. 4-B Eucer, Sec. 25-13s-9e. Drlg. sh. 2,020 ft.
Pan American Prod. Co. No. 12 Laws Realty Co., Sec. 36-13s-9e. Bldg. road.
J. P. Scranton No. 1 State Bayou, Sec. 30-13s-10e. Spd.

Convent—St. James Parish

Continental Oil Co. No. 2 Realty Operators, Inc., Sec. 16, 13⅜-in. csg. 1,492 ft.; T.D. 7,889 ft.; P.B. 7,275 ft.; sdtrkd. 7,305 ft.; cg. sdy. sh. 7,967 ft.

Creole—Cameron Parish

Superior Oil Co. No. 5 State-Gulf of Mexico, Sec. 4-15s-8w. T.D. 4,253 ft.; P.B.; sdtrkd.; drlg. sh. 4,277 ft.

Darrow—Ascension Parish

Humble O. & R. Co. No. 15 Gumbel, Sec. 33-10s-2e. Loc.
Humble O. & R. Co. No. 2 Rose, Sec. 33-10s-2e. Drlg. sdy. sh. 5,307 ft.
Kiva Oil Co. No. 1 Duplessis, Sec. 69-10s-2w. S.D. 2,523 ft.

Dog Lake—Terrebonne Parish

Texas Co. No. 22 State, Sec. 5-22s-16e. 13⅜-in. csg. 2,030 ft.; 7-in. csg. 6,901 ft.; T.D. 7,014 ft.; salt; P.B. 6,950 ft.; W.O.C.

Edgerly Field—Calcasieu Parish

R. H. Kean et al No. 1 M. J. Muller et al, Sec. 29-9s-11w. 7-in. csg. 2,804 ft.; bailed S.W.; S.D. 3,050 ft.

Eola—Avoyelles Parish

Pomo Prod. Co. No. 1 S. W. Sentel, Sec. 5-2s-3e. R.U.
Sid Richardson No. 2 Haas Inv. Co., Sec. 7-2s-3e. T.D. 1,428 ft.; 10¾-in. csg. 1,428 ft.
Sid Richardson No. 3 Haas Inv. Co., Sec. 7-2s-3e. Drlg. sh. 1,117 ft.

Fausse Point—Iberia Parish

Texas Co. No. 5 State Lake-Fausse Point, Sec. 35-11s-8e. Drlg. sh. 10,588 ft.

Garden Island—Plaquemines Parish

Texas Co. No. 31 State, Sec. 28-23s-33e. T.D. 6,915 ft.; 7-in. csg. 6,915 ft.

Gillis—Calcasieu Parish

Fohs Oil Co. No. 1 Green Heres, Sec. 11-9s-8w. Drlg. sh. 60 ft.
Union Sulphur Co. No. 8 Kaufman, Sec. 7-9s-8w. Loc.

Golden Meadows—La Fourche Parish

Martex Pet. Corp. No. 1 Falgout Holding Co., Inc., Sec. 9-19s-22e. R.U.

Grand Bay—Plaquemines Parish

Gulf Oil Corp. No. 25-A Erwin, Sec. 13-12s-10w. Drk.
Gulf Oil Corp. No. 4 Grand Prairie Lve. Dist., Sec. 48-20s-18e. Loc.
Gulf Oil Corp. No. 2 State, Sec. 6-20s-19e. Loc.

Gueydan—Acadia Parish

A. M. Barbe No. 1 G. L. Humble, Sec. 27-11s-1w. T.D. 8,685 ft.; perf. csg. 4,490-96 ft.; tstd. S.W.; S.D.

Hackberry—Cameron Parish

F. W. Bennett No. 1 Bickford, Sec. 37 12s-10w. Drlg. sh. 6,805 ft.
Gulf Ref. Co. No. 25-A Erwin, Sec. 13-12s-10w. Cg. sdy. sh. 3,420 ft.
Superior Oil Co. No. 2-C Kaough, Sec. 30-12s-10w, R.U.
Texas Co. No. 16-B State-Hackberry, Twp. 12s-9w. T.D. 8,201 ft.; salt; 7-in. csg. 7,950 ft.
Union Sulphur Co. No. 11 Doiron, Sec. 37-12s-10w. T.D. 7,203 ft.; 7-in. csg. 7,108 ft.; I.P. 816 B.P.D.; ¼-in. ck.
Union Sulphur Co. No. 12 Doiron, Sec. 37-12s-10w. Drlg. sh. 3,550 ft.
Union Sulphur Co. No. 13 Doiron, Sec. 37-12s-10w. R.U.R.
Union Sulphur Co. No. 1 Josephine O'Quinn, Sec. 37-12s-10w. Loc.
Union Sulphur Co. No. 45 Watkins, Sec. 13-12s-10w. Cg. sd. 3,067 ft.

Horseshoe Bayou—St. Mary Parish

Texas Co. No. 2 State, Sec. 37-17s-9e 9⅝-in. csg. 11,631 ft.; T.D. 12,770 ft.; set 1,659 ft. of 6⅝-in. csg. at 12,645 ft.; lost D.S.; fsg.

Jefferson Island—Iberia Parish

Texas Co. No. 2 Jefferson Island, Sec. 58-12-5e. 18⅝-in. csg. 40 ft.; cg. 7,755 ft.
Texas Co. No. 2 State-Lake Peigneur, Twp. 12s-5w. Drlg. sh. 1,610 ft.

Jennings—Acadia Parish

W. T. Burton No. 6 Roboria, Sec. 41-9s-2w. 7-in. csg. 6,721 ft.; fsg. tbg.; T.D. 6,997 ft.; sdtrkd. at 6,118 ft.; drld. to 6,178 ft.; sdtrkd. at 6,023 ft.; T.D. 6,732 ft.; trying to drill by fish; P.B. 6,104 ft.; W.O.C.; sdtrkd. 6,020 ft.; T.D. 6,056 ft.; 7-in. csg. 2,203 ft. and 10¾-in. csg. 2,108 ft.; sdtrkd.; drld into old hole; P.B.; sdtrkd. 2,302 ft.; drlg. sh. 6,596 ft.
Glassell & Glassell No. 5 McFarlain, Sec. 41-9s-2w. Drlg. sh.&sd, 5,288 ft.
Glassell & Glassell No. 6 McFarlain, Sec. 41-9s-2w. Drlg. sh. 6,379 ft.
L. & L. Oil Co. No. 4 Houssiere Latreille, Sec. 47-9s-2w. 7-in. csg. 1,817 ft.; T.D. 1,881 ft.; P.B. 1,848 ft.; drld. out 1,848 ft.; sanded up; C.O.
Shell Pet. Corp. No. 1 Prather, Drlg. sdy. sh. 6,567 ft.
Stanolind O. & G. Co. No. 114 Crowley Oil & Mineral Co., Sec. 48-9s-2w. R.U
Superior Oil Co. No. 16 Wm. Leckelt, Sec. 42-9s-2w. T.D. 8,304 ft.; run 7-in. csg.; oil show 7,800-70 ft.

Lafitte—Jefferson Parish

Texas Co. No. 1 Sch. Bd., Sec. 16-17s-24e. 13⅜-in. csg. 2,030 ft.; T.D. 10,622 ft.; 9⅝-in. csg. 10,622 ft.; T.D. 11,961 ft.; well tried to blowout; stk. D.S.; unable to recover D.S.; abd.
Texas Co. No. 2 State-Bayou Norman, Sec. 21-17s-24e. Loc.

Lake Hermitage—Plaquemines Parish

Gulf Oil Corp.-Humble O. & R. Co. No. 9 La Fourche Basin, Sec. 2-18s-25e. T.D. 3,166 ft.; 7-in. csg. 3,121 ft.; flwg. 84 B.P.D.; ¼-in. ck.

Leesville—La Fourche Parish

Texas Co. No. 7 Leeville, Sec. 27-21s-22e. T.D. 8,667 ft.; D.S. stk.; sdtrkd.; T.D. 8,436 ft.; sdtrkd.; T.D. 8,685 ft.; stk. 9⅝-in. csg. at 8,577 ft.; sdtrkd. 8,440 ft.; stk. D.S.; sdtrkd.; T. salt 9,713 ft.; T.D. 9,723 ft.; P.B. 8,100 ft.; perf. csg. 8,040-90 ft.; flwg. 64 B.P.D.; ⅝-in. ck.

Lirette—Terrebonne Parish

Humble O. & R. Co. No. 2 H. J. Ellender, Sec. 32-19s-19e. Drlg. sh. 9,225 ft.

Lake Long—La Fourche Parish

Fohs Oil Co. No. 7 State-Lake Long, Twp. 17s-19e. 18⅝-in. csg. 295 ft.; T. D. 10,248 ft.; 7-in. csg. 9,928 ft.; P.B. 9,875 ft.; perf. csg. 9,862-68 ft.; tstd. 780 lbs. press.; recvd. 270 ft. drlg. mud, cut with gas; perf. csg. 9,876-9,882 ft.; recvd. 30 ft. of gas-cut mud; sqzd. off perf.; perf. csg. 9,200-08 ft.; tstd. S.W.; perf. csg. 9,197-9,202 ft.; rec. 65 stands drlg. mud, S.W., trace of oil; 92 lbs. press.; sqzd. off perf.; perf. csg. 9,816-19 ft.; tstg.

New Iberia—Iberia Parish

Canal Oil Co. No. 5 Sabatier, Sec. 54-12s-7e. T.D. 2,504 ft.; run csg.
Wm. Helis No. 8 Bullock, Sec. 25-12s-7e. Drlg. sdy. sh. 1,772 ft.; no report.
Wm. Helis No. 5 Schwing, Sec. 56-12s-7e. T.D. 4,954 ft.; P.B. 4,188 ft.; W.O.C.
Lisbon-Iberia Oil Corp. No. 7 Gulf fee, Sec. 25-12s-7e. Drk.
Texas Co. No. 2 Bryant, Sec. 25-12s-7e. R.U.
Texas Co. No. 1 DeCuir, Sec. 25-12s-7e. Drlg. sh. 4,290 ft.
Texas Co. No. 2 Gonsoulin, Sec. 13-12s-7e. Drlg. L.&sh. 6,788 ft.
Texas Co. No. 2-A Hanzon, Sec. 54-12s 7e. Drlg. L. 7,242 ft.
Texas Co. No. 3-B Hanszen, Sec. 54-12s 7e. 7-in. csg. 6,838 ft.; T.D. 7,133 ft.; salt; P.B.
Texas Co. No. 1 Renaudet et al, Sec. 71-12s-7e. Drlg. sh.&L. 8,048 ft.

North Tepetate—Acadia Parish

Atlantic Ref. Co. No. 1 Alcide Fournerat, Sec. 11-7s-2w. T.D. 8,547 ft.; 7-in. csg. 8,048 ft.; perf. csg. 7,983-86 ft.; I.P. 69 B.F.P.D., 11% wash wtr.; grav. 51. ¼-in. ck.; T.P. 2,525 lbs.
Atlantic Ref. Co. No. 4 Klumpp, Sec. 12-7s-2w. Drlg. sh. 500 ft.

Port Barre—St. Landry Parish

Pan American Prod. Co. No. 5 Cormier, Sec. 4-6s-5e. T.D. 4,841 ft.; 7-in. csg. 4,812 ft.; I.P. 392 B.P.D.; 12/64-in. ck.
Pan American Prod. Co. No. 1 Rene Nezat. Drlg. sh. in sdtrkd. hole 4,581 ft.
Y. D. Spill No. 1 Gaudet, Sec. 4-6s-5e. S.D. 4,700 ft.

Potash—Plaquemines Parish

Humble O. & R. Co. No. 38 Orleans Lve. Dist., Sec. 13-18s-15e. Drk.
Western Gulf Prod. Co. No. 1 Paseale, Sec. 6-18s-27e. Loc.
Western Gulf Prod. Co. No. 1-A Treadway, Sec. 6-18s-27e. Loc.; (cor.).

Quarantine Bay—Plaquemines Parish

Gulf Oil Corp. No. 2-A Orleans Levee Bd., Sec. 7-19s-17e. 9⅝-in. csg. 5,660 ft.; T.D. 8,187 ft.; 7-in. csg. 8,079 ft.; I.P. 680 B.P.D.; ¼-in. ck.
Gulf Oil Corp. No. 1-A Plaquemines Ld. Co., Sec. 18-19s-17e. R.U.
Gulf Ref. Co. No. 5 State, Sec. 17-19s-17e. Loc.
Gulf Oil Corp. No. 9 State QQ, Sec. 18-19s-17e. Loc.

South Houma—Terrebonne Parish

Shell Pet. Corp. No. 2 Peters. Drlg. sdy. sh. 9,390 ft.

Raceland—La Fourche Parish

Amerada Pet. Corp. No. 1 Godchaux Sugars, Inc., Sec. 34-15s-19e. 18⅝-in. csg. 262 ft.; T.D. 11,312 ft.; 7-in. csg. 11,312 ft.; T.A.
Amerada Pet. Corp. et al No. 2 Godchaux, Sec. 34-15s-19e. Drlg. sdy. sh. 10,398 ft.
Tide Water Asso. Oil Co. No. 2-A South Coast Corp., Sec. 34-15s-19e. Dredge canal.

South Roanoke—Jeff Davis Parish

Continental Oil Co. No. 2 Sturdivant, Sec. 36-10s-4w. Drlg. sh. 6,588 ft.

St. Martinsville—St. Martin Parish

Continental Oil Co. No. 1 Standard of Kans., Sec. 13-10s-6e. Cd. sd.&sh., oil odor 5,866-76 ft.; drlg. sh. 7,472 ft.

Timbalier Bay—La Fourche Parish

Gulf Oil Corp. No. 4 State. T.D. 7,268 ft.; sdtrkd.; T.D. 5,323 ft.; 5-in. csg. 5,320 ft.

Valentine—La Fourche Parish

Pan American Prod. Co. No. 19 Harang, Sec. 8-17s-20e. Loc.

Venice—Plaquemines Parish

Tide Water Asso. Oil Co. No. 3 Buras Lve. Bd., Sec. 23-21s-30e. T.D. 2,339 ft.; salt; top salt 2,274 ft.; abd.
Tide Water Asso. Oil Co. No. 9 Manhattan Land & Fruit Co., Sec. 26-21s-30e. 10¾-in. csg. 2,457 ft.; top salt 5,505 ft.; T.D. 5,565 ft.; sdtrkd. 4,647 ft.; top salt 5,603 ft.; P.B. 3,725 ft.; sdtrkd. 3,807 ft.; T.D. 5,770 ft.; 7-in. csg. 5,770 ft.; perf. csg. 5,700-10 ft.; I. P. 243 B.P.D.; 5/32-in. ck.

Villa Platte—Evangeline Parish

Continental Oil Co. No. 1 Crise Deville, Sec. 26-3s-2e. R.U.
Continental Oil Co. No. 1 Fontenot-Deshotels, Sec. 44-3s-2e. Drlg. sh. 8,252 ft.
Continental Oil Co. No. 1 Fontenot Ludean, Sec. 45-3s-2e. T.D. 9,048 ft.; 6-in. csg. 9,047 ft.; I.P. 383 B.P.D.; ⅛-in. ck.
Continental Oil Co. No. 3 Opelousas-St. Landry Securities Co., Sec. 44-3s-2e. R.U.
Continental Oil Co. No. 1 Rene McDaniel, Sec. 45-3s-2e. Drk.
Continental Oil Co. No. 1 Tate, Sec. 45-3s-2e. Drlg. sh. 4,663 ft.
Continental Oil Co. No. 2 Tate, Sec. 44-3s-2e. T.D. 9,085 ft.; I.P. 225 B.P.D.; ⅛-in. ck.
Continental Oil Co. No. 2 Vidrine, Sec. 34-3s-2e. Drlg. sh. 8,306 ft.
Continental Oil Co. No. 3 Vidrine, Deville, Sec. 46-3s-2e. Drk.

Vinton—Calcasieu Parish

J. M. Donald et al No. 1 Gordon, Benchenstein-Flynn, Sec. 34-10s-12w. T.D. 1,000 ft.; abd.

Woodlawn—Jeff Davis Parish

Union Sulphur Co. No. 4 Calcasieu Natl Bnk., Sec. 12-9s-6w. Drlg. sh.&L. 7,170 ft.
Union Sulphur Co. No. 2 Osmon, Sec. 7 9s-5w. Cg. 8,959 ft.

S. LOUISIANA WILDCATS

Acadia Parish

T. T. Tolson et al No. 1 J. Turner, Sec. 25-7s-1e. M.I.M.
Tri Parish Drillers, Inc., No. 1 Paul Stag, Sec. 4-7s-1w. Drk.

Assumption Parish

Humble O. & R. Co. No. 1 Milliken & Farewell Co., Inc., Sec. 79-14s-14e. 13⅜-in. csg. 2,978 ft.; drlg. sdy. sh. 10,611 ft.

Calcasieu Parish

David B. MacDaniel No. 2 Sch. Ld., Sec. 16-9s-7w. 15½-in. csg. 46 ft.; 10¾-in. csg. 1,299 ft.; T.D. 7,890 ft.; S.D.

Cameron Parish

Humble O. & R. Co. No. 1 Cameron Parish Sch. Ld., Sec. 16-12s-6w. T.D. 9,101 ft.; run 7-in. csg.
Superior Oil Co. No. 2 John Sells, Sec. 4-15s-8w. Drk.
Superior Oil Co. et al No. 1 State, Grand Lake, Sec. 24-13s-4w. Loc.

Iberia Parish

Texas Co. No. 1 Petit Anse, Sec. 59-13s-6e. Cg. sd. 7,225 ft.
Texas Co. No. 3-B State-Vermilion Bay, Twp. 16s-5e. Drlg. sd. rk. 1,712 ft.
Texas Co. No. 3-B State-Vermilion Bay, Twp. 16s-5e. Drlg. sd. rk. 1,712 ft.
Texas Co. No. 2-B Vermilion Bay, Twp. 16s-5e. T.D. 9,667 ft.; cleaned hole with reversing tool to 6,381 ft.; twisted off D.S.; T.A.

Iberville Parish

California Co. No. 1 Schwing Lbr. Co., Sec. 96-10s-10e. 20-in. csg. 177 ft.; 9⅝-in. csg. T.D. 10,106 ft.; twisted off drill collar; P.B. to sdtrk.
Humble O. & R. Co. No. 1 Iberville Mortgage Loan Co., Inc., Sec. 74-7s-10e. Loc.
Shell Pet. Corp. No. 1 Natalbany Lbr. Co., Sec. 18-9s-2e. Drlg. sh. 6,736 ft.

La Fourche Parish

Gulf Oil Corp. No. 1 Grandison Ld. Co., Sec. 14-20s-23e. M.I.M.
Texas Co. No. 1 L.L.&E. Golden Meadows, Sec. 77-19s-21e. Drlg. sd. 10,260 ft.
Texas Co. No. 1 State-Catfish Lake, Sec. 77-19s-21e. 18⅝-in. csg. 90 ft.; T.D. 8,205 ft.; D.S. stk.; P.B. 5,783 ft.; sdtrkd.; drlg. sdy. sh.&L. 9,659 ft.

Orleans Parish

W. T. Burton No. 1 L.&N.R.R., Sec. 18-11s-15e. Drlg. sd.&sh. 3,460 ft.
W. T. Burton No. 3 L.&N.R.R., Sec. 25-11s-14e. Loc.
W. T. Burton No. 1-B R. E. E. de Montluzin, Sec. 1-10s-13e. Drk.
W. T. Burton No. 1 State-Lake Pontchartrain, Twp. 10s-13e. T.D. 8,367 ft.; P.B. 7,775 ft.; sdtrkd. at 7,959 ft.; T. D. 8,165 ft.; 9⅝-in. csg. 8,165 ft.; T.D. 8,241 ft.; tstd. S.W.; D.S.T. 8,135-8,241 ft.; T.D. 11,149 ft.; cutting and pulling stk. D.S.; S.D.

Plaquemines Parish

Texas Co. No. 1 L.L.&E., Bastian Bay, Sec. 43-20s-28e. Drlg. sd.&sh. 9,374 ft.

Rapides Parish

Gulf States Explin. No. 1 Erwin & Bishop, Sec. 35-1n-3w. Loc.

St. Bernard Parish

Gulf Ref. Co. No. 4-State-R.R. (Lake Borgne), Twp. 12s-15e. 9⅝-in. csg. 8,161 ft.; T.D. 10,632 ft.; rmg. at 9,698 ft.
Wm. Helis et al No. 1 Mereaux Munez, Sec. 34-12s-12e. T.D. 9,634 ft.; P.B. to sdtrk. at 9,370 ft.
Vendome Pet. Corp. No. 1 Kenilworth Plantation, Sec. 59-13s-14e. Drlg. sh. 10,665 ft.

St. Charles Parish

Texas Co. No. 1 L.L.&E. Paradis, Sec 39-14s-20e. Drlg. sdy. L. 9,025 ft.; 9⅝-in. csg. 8,975 ft.

St. James Parish

Shell Pet. Corp. No. 1 Shexnayder, Sec. 38-12s-15e. 9⅝-in. csg. 8,534 ft.; cg. sdy. sh. 9,858 ft.; D.S.T. 9,823-32 ft.; tstd. S.W.

St. Martin Parish

Magnolia Pet. Co. No. 1 Mercelin, Sec. 8-10s-7e. Drlg. sh. 3,200 ft.
Texas Co. No. 11 St. Martin Ld. Co., Sec. 21-8s-7e. Top salt 8,904 ft.; T.D. 9,404 ft.; 7-in. csg. 8,912 ft.; P.B. 7,175 ft.; drld. out to bttm.; P.B. 8,080 ft.; perf. csg. 8,060-70 ft.; tstd. mud, gas and S.W.; sqzd. off perf.; perf. csg. 8,060-65 ft.; tstd. 38 stands oil and gas showing fresh wtr.; set screen and lnr.; pmpg.; showing est. 25 B.O.; 7 lnr.; lowered tbg. to 6,987 ft.; pmpg. and swbg. making est. 120 bbls. net oil per day with 57% S.W.; tstg.; plld. rods and tbg.; set cmt. plug 7,630-7,812 ft.; perf. csg. 7,700-12 ft., 7,295-7,303 ft., and 7,260-67 ft.; tstd. S.W.; S.D.

St. Mary Parish

Phillips Pet. Co. No. 1 Whitney Natl. Bnk., Sec. 13-15s-12e. Drlg. sh. 6,550 ft.

St. Tammany Parish

A. P. Portas No. 1 W. C. Forbes, Sec. 33-7s-15e. Drk.

Terrebonne Parish

Texas Co. No. 1 Continental Ld. & Fur Co., Sec. 29-18s-14e. 18⅝-in. csg. 101 ft.; T.D. 10,039 ft.; P.B. 9,852 ft.; sdtrkd. 9,984 ft.; T.D. 12,483 ft.; shot pipe off at 9,950 ft.; milling on junk. capped; abd.
Texas Co. No. 2 State-Coon Point, Twp. 23s-14e. 13⅜-in. csg. 1,900 ft.; T.D. 2,851 ft.; driving piling.

ARKANSAS

Calhoun County

J. R. Lockhart No. 1 Southern Craft Corp. SE cor. NW NW Sec. 17-14-13. Top Nac. 2,372 ft.; top Tokio 2,920 ft.; S.D. 3,291 ft.; arng. resume drlg.

Columbia County

Atlantic Ref. Co. No. 1 A. S. Crisp, NW cor. NW NE Sec. 23-17-20. Drlg. rd.& gr. sh. 4,260 ft.
Atlantic Ref. Co. No. 1-B Garrett, C NW NW Sec. 24-17-20. Set 16-in. csg. 130 ft.; drlg. 2,180 ft.
W. L. Goidston No. 1 A. C. Garrett, C SE SW Sec. 13-17-20. Set 16-in. 134 ft.; 10¾-in. csg. 2,227 ft.; cd. por. L. gas odor 7,374-94 ft.; T. Rey. L. 7,372 ft.; T. sat. 7,463 ft.; cd. 7,490-7,510 ft.; por. sat. ool. L.; set 7-in. csg. 7,500 ft.; to test; T.D. 7,510 ft.
Alice Sydney Oil Co. No. 1 Crisp, Sec. 23-17-20. 16-in. csg. 127 ft.; drlg. rd.& gr. sh. 5,505 ft.
Southwood Oil Co., Inc., No. 1 J. O. Hutcheson, C NE SW Sec. 14-17-20. Por. oolitic L. 7,500-53 ft.; T. Rey. L. 7,497 ft.; T. sat. L. 7,502 ft.; cd. 7,553-65 ft.; por. sat. ool. L.; set 7-in. csg. 7,545 ft.; drlg. plug 7,565 ft.
Southwood Oil Co., Inc., No. 2 J. O. Hutcheson, C SE SW Sec. 14-17-20. 16-in. csg. 135 ft.; drlg. 4,918 ft.
Standard Oil Co. of La. No. 3 Crone, SW cor. NE SW Sec. 8-16-22. T. L. 7,238 ft.; por. L. 7,240-56 ft.; set 6-in. csg. 7,241 ft.; T.D. 7,267 ft.; acdzd. with 3,000 gal.; comp.; 63 B.P.H.; 1-in. ck.; b.s., 1.5%; C.P. 185 lbs.; T.P. 60 lbs.
Standard Oil Co. of La. No. 1 Lewis Unit, SE cor. NW NE Sec. 15-17-19. T. L. 7,364 ft.; cd. por. L. 7,398-7,428 ft.; drlg. L. 7,428 ft.

Craighead County

Tannark, Inc., No. 1 Ruby M. Martin, 580 ft. NL, 80 ft. EL, Sec. 35-14n-3e. Fsg. for bit 1,735 ft.

Hot Spring County

John H. James No. 1 Sturgess Lbr. Co., SW cor. SW SE Sec. 24-6-18. 10-in. csg. 58 ft.; cd. hd. dense gr. L. 964-78 ft.; drlg. hd. L. rk. 1,078 ft.

Lafayette County

Shell Pet. Corp. and Ohio Oil Co. No. 1 Warren, C SE SE Sec. 13-16-24. 13⅜-in. 194 ft.; 9⅝-in. 2,272 ft.; T. Bknr. 6,920 ft.; D.S.T. 7,169-7,228 ft.; shwd. S.W. and oil; tstg.; set 7-in. csg. 7,169 ft.; T. L. 7,165 ft.; T. por. L. 7,173 ft.; wtr. contact 7,186 ft.; T.D. 7,225 ft.; acdzd. with 3,000 gal.; swbd. S.W.; S.S.G.; S.D. W.O. 7,284 ft.; P.B. 7,420 ft. to 7,284 ft.
Wadley-Erwin et al No. 1 G. W. Taylor, C NE SW Sec. 15-19-26. 13⅜-in. csg. 447 ft.; T. anhy. (cor.) 5,312 ft.; T. Hill 5,855 ft.; T. Gloyd 5,992 ft.; por. Gl. 6,071-76 ft. (S.W.); Dees sd. 6,114-17 ft. (tight); T. Young 6,154 ft.; cg. hd. bi. sh. strks. L. 6,684 ft.

Little River County

Barbee et al No. 1 Ada Mills, SE cor. SW NW Sec. 18-12-29. R.U.
C. & M. Drlg. Co. No. 1 Strawn, SW cor. SE Sec. 20-10-32. Cd. 1,270-90 ft.; sh.& wtr. sd.; reported S.O. 1,365-70 ft.; S.D.; fuel oil; sd. sh. 1,395 ft.
Harford Oil Corp. No. 1 Pinning, C NE NE SW Sec. 6-13-30. S.D.; W.O. 1,925 ft.
Joe G. Strahan et al No. 2 Dierks Lbr. Co., Sec. 21-12-28. S.D. for D.S. 3,797 ft.

Lonoke County

Carlisle Oil Dev. Co. No. 1 Walthour-Flake, NW cor. Sec. 10-1n-7w. D.&A.; sdy. sh. 1,750 ft.
Lonoke-Prairie Dev. Co. No. 1 T. Young, C NW NW Sec. 8-3n-7w. Hole clean; U.R. 8¼-in. csg. 236 ft.; T.D. 300 ft., sd.; S.D.
W. L. Tedford No. 1 Anderson, 8-in. 400 ft.; arng. run 5-in. csg. on pkr. to S.O. wtr. flw.; prep. run 5-in. csg. to shut off wtr., 950 ft.

Miller County—Rodessa

Berkshire Oil Co. No. 2 Watson, NE SE Sec. 2-20-28. Drlg. sh. & L. 4,708 ft.
Gerhig Co. No. 4 Mitchell, SE SW Sec. 2-20-28. Drlg. anhy.&sh. 5,433 ft.
Gerhig Co. No. 2 Watson, NE cor. N SE Sec. 2-20-28. Drlg. anhy. 5,667 ft.
Gulf Ref. Co. No. 5 Johnson, SW cor. Sec. 2-20-28. Drlg. anhy.&sh. 5,629 ft.
Lyons & Merritt No. 1 Matlock, SE cor. Sec. 2-20-28. Drlg. sh.&L. 4,708 ft.
Mrs. S. O. Thompson No. 1 Gen. Am. Life Ins. Co., SE cor. SE SW Sec. 20-14-26. Cd. 3,657 ft.; slightly por. sdy.

L.; D.S. stk.; T.D. 3,825 ft.; D.S.T. 3,677-95 ft.; tstd. 15 thribbles S.W.; 8 min.; S.D.; W.O.; 3,851 ft.

Mississippi County

Benedum & Trees Oil Co. No. 1 Mack, 330 ft. SW cor. NW SW Sec. 2-15n-12e. Top Nac. 2,160 ft.; set 7-in. csg. 2,897 ft.; drlg. very hd. gr. L. 4,178 ft.

Nevada County

Benedum & Trees Oil Co. No. 1 T. Erby, SW cor. SW SW Sec. 3-14-20. 10-in. csg. 100 ft.; cd. sd. 2,120-21 ft.; 7-in. csg. 2,120 ft.; T.D. 2,121 ft.; comp.; pmpg. 75 B.P.D.

Webb & Franks No. 1 P. T. Grayson, SW cor. NW SE Sec. 4-14-20. Tokio sd.; D.S.T. 2,098-2,102 ft.; 10 min.; rec. 200 ft. oil and mud; open ck.; set 7-in. csg. 2,099 ft.; T.D. 2,102 ft.; drlg. plug. 2,102 ft.

Texas Canadian Oil Co. No. 3 Stocks, C SW NE Sec. 9-15-22. 10-in. csg. 20 ft.; 7-in. csg. 1,341 ft.; T. Nac. 1,183 ft.; ripped csg. 1,190-96 ft.; bld. S.S.O.; T. D. 1,204 ft.; S.W. and abd.

Ouachita County

Deep Rock Oil Corp. No. 1 C. Wesson, SE cor. NE Sec. 23-15-19. Set 13-in. csg. 350 ft.; cd. T. C. V. 4,305 ft.; T. Buckner 5,700 ft.; T. Smkvr. 5,923 ft.; por. L. 5,934 ft.; drld. 6,003-54 ft.; set 5½-in. csg. 6,038 ft.; T.D. 6,054 ft.; T. plug 5,998 ft.; bld. csg. dry; perf. 5,930-50 ft.; tstd. oil and S.W.; W.O.

Union County—Schuler

E. M. Jones No. 1 J. C. Morgan, SE NW Sec. 13-18-18. Set 16-in. 144 ft. and 10¾-in. csg. 2,154 ft.; T. Jones sd. 7,573 ft.; cd. to 7,592 ft.; T.D. 7,650 ft.; 7-in. csg. 7,639 ft.; comp.; 130 B.P.D.; ¼-in. ck.; T.P. 825 lbs.; C.P. 750 lbs.; perf. 7,585-7,610 ft.

E. M. Jones No. 2 J. C. Morgan, SE cor. NE NW Sec. 13-18-18. T. Jones sd. 7,571 ft.; T.D. 7,647 ft.; set 7-in. csg. 7,636 ft.

Lion Oil Ref. Co. No. 2 Henry, C N SE SE Sec. 12-18-18. Set 16-in. csg. 115 ft.; 10¾-in. csg. 1,920 ft.; W.O.C.

Roberts & Murphy No. 3 Leona, NW cor. Lot 6, SW Sec. 7-18-17. Drlg. rd. sdy. sh. 7,398 ft.

Union County—Other

Ark. Southern Oil Corp. No. 3-A Simmons, NW cor. NE NW Sec. 15-18-13. O.W.D.D. Graves sd. 2,612-29 ft.; tstd. gas; P.B. to Nacatoch sd.; S.D. 2,629 ft.; W.O.

J. R. Lockhart No. 3 Raulston, SE cor. NE SE Sec. 12-17-14. 10-in. csg. 105 ft.; W.O.C.

Mullins & Brooks et al No. 1 Nash, 500 ft. N and 338 ft. W of SE cor. NW SE Sec. 7-17-13. 10-in. csg. 148 ft.; D.S.T. 3,037-52 ft.; rec. 250 ft. oil and 30 ft. S.W.; 14-min.; W.P. 4 lbs.; top pay 3,232 ft.; 5½-in. 3,100 ft.; drld. out to 3,069 ft.; perf. 3,022-44 ft.; tstd. S.S.O.&G. and S.W.; reperf. 3,020-44 ft.; swbd. 100 B.P.D. for 3 days; W.O.

S.R. 3,232 ft.

Mullins & Brooks et al No. 2 Nash, C NW SE Sec. 7-17-13. Drlg. 2,390 ft.

Sklar Oil Corp. No. 10 Murphy, SW NE Sec. 9-16-15. Drlg. sd.&sh. 1,990 ft.

Sloan Wells, Tr., No. 4 G. J. Childs, 150 ft. NW cor. NE SW Sec. 8-16-16. O.W. W.O.; O.T.D. 2,656 ft.; wsg. to bttm.

Snuggs Sebersky & Bylick No. 1 J. N. Jerry, NE cor. SE SW Sec. 21-17-14. Set 10-in. csg. 118 ft.; S.D.

NORTH MISSISSIPPI

Calhoun County

L. C. Lucas No. 1 E. C. Boland, 400 ft. E and 500 ft. S, NW cor. SW Sec. 9-22n-9e. S.D. 791 ft.

Clarke County

Jeremiah L. Ryan et al No. 1 M. Eddins, 500 ft. SE cor. Sec. 29-2n-14e. S.D. 290 ft.; changing ownership; will resume drlg.

Hinds County

G. Jefferys No. 1 Gaddis Farms, Inc., NW cor. SE Sec. 26-7n-4w. S.D. 3,448 ft.

Cleve Love et al No. 1 S. F. Johnson, NE cor. Sec. 29-6n-1w. S.D. 5.218 ft., sd.; arng. D.D.

Montgomery County

Dr. T. H. Chichester No. 1 Mitchell, Sec. 36-20n-7e. Drk.

Pontotoc County

Waldrop et al No. 1 Bray, Sec. 17-11s-1e. S.D. 310 ft.

Simpson County

Cleve Love No. 1 N. E. Garner, SW cor SW NE Sec. 1-10n-17w. S.D. 900 ft.

Goodwill O. & G. Co. No. 1 Berry, Sec. 33-2n-4e. S.D. 2,810 ft.

FLORIDA

Levy County

Florida Oil Discovery No. 2 Cedar Key Co., Sec. 9-15s-13e. S.D.; W.O.; T.D 4,092 ft.

Nassau County

St. Mary Oil Corp. No. 1 Hillard, Sec. 19-4n-24e. Set 6⅝-in. csg. 3,935 ft.; fsg. D.S. 4,575 ft.

Lake County

Union O. & R. Co. No. 1 Gulf Explr., Sec. 17-24s-25e. S.D. 235 ft.

Suwanne County

J. W. Phillips Oil Explrn. Co. No. 1 Shilkett, Sec. 14-4s-14e. Drlg. 150 ft.

ALABAMA

Barbour County

H. A. Stebbinger et al No. 1 Mrs. Alyce Robertson, C NE NE Sec. 19-10n-25e. T.D. 4,310 ft.; rmg. 4,100 ft.

TEXAS

Week Ending February 18

GULF COAST FIELDS

Hastings Field—Brazoria County

Stanolind O. & G. Co. No. 2-C Cecil Brown, W. H. Snyder Sur. Drk.

Old Ocean—Brazoria County

Harrison & Abercrombie No. 3 Armstrong Plantation, Polley & Chance Sur. Drlg. sh. 10,201 ft.

Harrison & Abercrombie No. 5 Armstrong, Polly & Chance Sur. Drlg. sh. 1,730 ft.

Harrison & Abercrombie No. 6 Bernard River Ld. & Dev. Co., C. Breen Sur. Drlg. sh. 4,567 ft.

Harrison & Abercrombie No. 1 Lola Buck, Polly & Chance Sur. Cg. sh. 10,210 ft.

Sun Oil Co. No. 2 Campbell, Chas. Breen Sur. R.U.

Cedar Point—Chambers County

Standard Oil Co. of Texas et al No. 56-94 State. R.U.

Seabreeze—Chambers County

Sun Oil Co. No. 2 Barrow, A. Ybarbo Sur. Drlg. sh. 2,036 ft.

Sun Oil Co. No. 1 Pipkin, W. M. Mays Sur. No. 104. Drlg. sh. 4,876 ft.

West Columbia—Brazoria County

Frost & Dunman No. 1 E. C. Parker, G. Tennille Sur. Drlg. 1,410 ft.

General Crude Oil Co. No. 1-B Campbell, S. M. Williams Sur. Drk.

Texas Co. No. 31 Abrams, G. Tennille Sur. Drlg. sh. 2,530 ft.

Texas Co. No. 11 Phillips, G. Tennille Sur. Drlg. sh. 3,696 ft.

Green's Lake—Galveston County

Sun Oil Co. No. 3 Houston Farms Dev. Co., D. Buckley Sur. Drlg. sh. 3,328 ft.

League City—Galveston County

Geo. Echols No. 2 J. H. Ross, Perry & Austin Sur. 10¾-in. csg. 2,550 ft.; cg. sdy. sh. 9,079 ft.

Gulfboard Oil Corp. et al No. 1 Ross-Stewart, Perry & Austin Sur. 10¾-in. csg. 3,100 ft.; T.D. 10,000 ft.; 5½-in. csg. 9,050 ft.

Midstates Oil Co. No. 2-A Maco Stewart, Perry & Austin Sur. Cg. 8,867 ft.

Phillips Pet. Co. No. 1 Brittnacher, S. F. Austin Sur. T.D. 8,871 ft.; fsg.

Phillips Pet Co. No. 1 J. C. Ott, S. F. Austin Sur. Cd. O.S. 7,070-9,110 ft.; drlg. sh. 10,256 ft.

Phillips Pet. Co. No. 1 Dr. Patton, S. F. Austin Sur. T.D. 10,535 ft.; 5½-in. csg. 10,412 ft.; perf. csg. 10,156-80 ft. and 10,115-27 ft.; P.B. to test.

Phillips Pet. Co. No. 1 Stewart, Title Guaranty, S. F. Austin Sur. Top sd. 9,072 ft.; T.D. 9,274 ft.; P.B.; sdtrkd.; drlg. sh. 9,086 ft.

West Prod. Co. No. 1 fee, Lot 2, Blk. 5, Perry & Austin Sur. Loc.

Bammel—Harris County

H. M. Harrell No. 1 Bahr, J. Schnell & H. Simmons Sur. Drlg. sh. 5,136 ft.

Clear Lake—Harris County

Humble O. & R. Co. No. 3 Hutcheson, Wm. Doble Sur. Drlg. sh. 2,930 ft.

Clinton—Harris County

Stanolind O. & G. Co. No. 2 Edwards, Reels & Trobough Sur. Drk.

Eureka—Harris County

Jack Frazier No. 1 W. T. Helberg, H Reinerman Sur. R.U.

Jack Frazier No. 1, Shady Acres subd., Henry Reinerman Sur. Drlg. sh. 269 ft.

Housh & Thompson No. 1 Helberg et al, H. Reinerman Sur. Top sd. 7,687 ft.; 5½-in. csg. 7,718 ft.; perf. csg. 7,687-97 ft.; gas-oil ratio high; killed; retstg.

Houston Oil Co. No. 3 Helberg & Lackner, J. Reinerman Sur. Loc.

Houston Oil Co. No. 2 D. Lackner, H. Reinerman Sur. R.U.

Fairbanks—Harris County

Amerada-Stanolind O. & G. Co. No. 1 Post, G. Williams Sur. Drlg. sh. 2,836 ft.

L. Barrett No. 1 Jack Jeter, J. Bays Sur. R.U.

E. M. Hailey No. 1 Albert Brown, J. Clarkson Sur. T.D. 6,842 ft.; 5½-in. csg. 6,841 ft.; flwd. oil and S.W.; reperf. csg. 6,838-40 ft.

Kirby Pet. Co. No. 1 Daniels, S. S. Reynolds Sur. Drlg. sh. 6,139 ft.

Union Prod. Co. No. 2 Warneke, Sam Lewis Sur. T.D. 6,841 ft.; perf. csg. 6,827-30 ft.; showed too much gas; sqzd. off perf.

Friendswood—Harris County

Humble O. & R. Co. No. 7-B Humble-West, Luke Hemenway Sur. Drlg. sh. 2,236 ft.

Humble O. & R. Co. No. 1 J. L. Jones, Perry & Austin Sur. Drk.

Humble O. & R. Co. No. 3 Settegast, T. Choate Sur. Drk.

Humble O. & R. Co. No. 1 E. E. Watson. Drk.

Humble O. & R. Co. No. 8-B Humble-West, Luke Hemenway Sur. T.D. 6,047 ft.; tstg.

Cheek—Jefferson County

Geo. H. Echols No. 1 Beaumont Launch Club, C. Hildebrandt Sur. R.U. (cor.).

Humble O. & R. Co. No. 1 Broussard Tr., C. Hildebrandt Sur. Drlg. L. 7,034 ft.

Humble O. & R. Co. No. 1 E. K. Fallor, C. Hildebrandt Sur. T.D. 7,740 ft.; 5½-in. csg. 7,740 ft.; perf. 7,722-27 ft.; killed to recomp.; gas-oil ratio too high; reperf. csg. 7,722-24 ft.; flwd. for 2½ hrs.; went dead.

Humble O. & R. Co. No. 1 Pitre, C. Hillebrandt Sur. Loc.

La Belle—Jefferson County

Sun Oil Co. No. 5 Broussard-Hebert, T. &N.O. Sur. No. 207. Bldg. drk.

Cordele—Jackson County

H. J. Porter No. 1 Woussi, Peter White Sur. Loc.

Esperson—Liberty County

General Crude Oil Co. No. 1 Burgess et al, A. McNeil Sur. R.U.

Hardin—Liberty County

Atlantic Ref. Co. No. 1 Humphrey, F. Hardin Sur. Bldg. road.

Atlantic Ref. Co. No. 1 Rives, A. B. Hardin Sur. T.D. 7,649 ft.; 7-in. csg. 7,649 ft.

Gulf Oil Corp. No. 4 Cessna, H. B. Johnston Sur. R.U.

Gulf Oil Corp. No. 4 Tullos, H. B. Johnson Sur. Drlg. sh. 2,910 ft.

Humble O. & R. Co. No. 1-B Partlow, H. B. Johnston Sur. Drlg. sh. 4,192 ft.

Texas Co. No. 2 Smith, A. A. Hardin Sur. R.U.

Orange—Orange County

Continental Oil Co. No. 18 Chesson, Wm. Dyson Sur. Drlg. sh. 5,539 ft.

Gulf Oil Corp. No. 2 Lafleur, Wm. Dyson Sur. Drlg. sh. 1,642 ft.

Gulf Oil Corp. No. 10-A Winfree, Wm. Dyson Sur. Loc.

Hankamer et al No. 1 Conley, Wm. Dyson Sur. 5½-in. csg. 5,957 ft.

John Mayo No. 1 M. J. Williams, J. Dyson Sur. Drk.

Port Neches—Orange County

Texas Co. No. 13 Kuhn, M. E. Hall Sur. Drlg. sh. 1,868 ft.

Ace—Polk County

Peyton Bros. No. 3-B Kirby West, G. S. Thomas Sur. Rec. 450 ft. P.L.O.; D.S.T. 7,745-55 ft.; T.D. 7,788 ft.; perf. csg. 7,748-62 ft.; flwd. 493 B.P.D.; ¼-in. ck.; T.P. 425 lbs.; C.P. 1,250 lbs.

Dick Schwab No. 1-C Kirby-West Lbr. Co., G. A. Thomas Sur. Loc.

Shell Pet. Corp. No. 1 Doucett, P. A. Sublett Sur. Drlg. sh. 5,920 ft.

Shell Pet. Corp. No. 2 Doucett, P. A. Sublett Sur. Loc.

Segno—Polk County

Gulf Oil Corp. No. 4 Quinn, A. Morales Sur. R.U.

Gulf Oil Corp. No. 1 Ragan, I.&G.N. Sur. No. 15. R.U.

Gulf Oil Corp. No. 5 Ragan, I.&G.N. Sur. No. 15. Loc.

Gulf Oil Corp. No. 6 Ragan, I.&G.N. Sur. No. 15. Drlg. sh. 4,756 ft.

Spurger—Tyler County

Republic Prod. Co. No. 17 fee, N. Hurd Sur. Cg. sh. 7,736 ft.

Katy—Waller County

Stanolind O. & G. Co. No. 1 McCarthy, Williamson, H.&T.C. Sur. Loc.

GULF COAST WILDCATS

Brazoria County

Crosby Drlg. Co. No. 1 Geo. S. Wilson, A. C. Reynolds Sur. Bldg. road.

Fabriguze et al No. 1 Freeport Sulphur, Stephen F. Austin Sur. (Bryan Mound). M.I.M.

Humble O. & R. Co. No. 1 Walker, S. Marsh Sur. 13⅜-in. csg. 2,419 ft.; drlg. sh. 9,349 ft.

Texas Co. No. 6 Freeport Sulphur Co., C. Ariola Sur. 10¾-in. csg. 1,270 ft.; drlg. sh. 3,327 ft.

Chambers County

Geo. Anderson No. 1 Julia Casey, W. D. Smith Sur. Loc.

L. D. Roberts No. 1 C. H. Lang, T.&N. O. Sur. No. 35. Drk.; (cor.).

Colorado County

Mills Bennett Prod. Co. No. 1 J. M. Truchard, Ed Curbit Sur. 13⅜-in. csg. 968 ft.; drlg. sh. 7,086 ft.

Fort Bend County

Geo. Echols No. 1 Smith, Moses Shipman Sur. S.D. 6,003 ft.

Galveston County

Sun Oil Co. No. 2 Cade, A. Dickson Sur. Drlg. sh. 6,545 ft.

Harris County

H. C. Cockburn No. 1 Lena Griffith, Adam Sur. Loc.

Cron & Gracey No. 1 McDonald, Andrew Lawson Sur. Spd.

H. H. Givens No. 2 F. K. Adone, David Middleton Sur. Drk.

Jefferson County

British American Oil Co. No. 3 Glady City, J. A. Veatch Sur. (SW flank Spindletop). Drlg. sh. 5,936 ft.

I. E. Harwell No. 1 State, Gulf of Mexico, T.D. 5,840 ft.; D.S. stk.; pulled in two; S.D.

Humble O. & R. Co. No. 13-B McFaddin-State, Sec. 8. 10¾-in. csg. 2,758 ft.; T.D. 5,859 ft.; D.S. stk.; backed off at 3,688 ft.; P.B. 4,220 ft.; sdtrkd.; T.D. 6,014 ft.; sdtrkd.; T.D. 6,115 ft.; fsg.

Matagorda County

Maja Oil Co. No. 1 Robbins, A. Sheppard Sur. R.U.

Sun Oil Co. No. 1 Cavallin, Theo. F. Koch subd., John Duncan Sur. 9⅝-in. csg. 8,502 ft.; drlg. sh. 9,141 ft.

Montgomery County

Deep South Pet. Co. No. 1-A Foster Lbr. Co., Pryor Bryan Sur. Loc.

H. A. Pennington et al No. 1 F. L. Banker, L. M. H. Washington Sur. S.D. 1,033 ft.

J. Smith et al No. 1 J. V. Scott, F. A. B. Wheeler Sur. S.D. 3,623 ft.

Newton County

Sun Oil Co. No. 1 Peavy-Moore Lbr. Co., T.&N.O.R.R. Sur. Loc.

Orange County

Sun Oil Co. No. 1 Lutcher-Moore Lbr. Co., B. Johnson Sur. T.D. 7,867 ft.; P.B.; sdtrkd.; 7-in. csg. 9,402 ft.; T.D. 9,705 ft.; D.S. stk.; P.B. 8,384 ft.; sdtrkd.; T.D. 9,664 ft.; P.B. 8,900 ft.; drld. to 9,020 ft.; perf. csg. 8,995-9,010 ft.; tstg.; flwg. est. 100 B.F.P.D., 22 to 85% S.W. and 15 to 78% oil, varying at various times; well went dead; swbg. 98% S.W., 2% oil.

San Jacinto County

J. W. Frazier No. 1 Annie Smith, J. D. Martinez Sur. No. 10. M.I.M.

Washington County

Mount Selman Oil Co. No. 1 Fritz Fuelberg, John Lightfoot Sur. R.U.

Wharton County

Helmerich & Payne No. 1 J. L. Myatt, E.T.R.R. Sur. Loc.

S. W. TEXAS WILDCATS

Bell County

M. M. Gordon No. 1 Steele, Oliver T. Tyler Sur. S.D. 1,201 ft.

G. P. Shelton et al No. 1 Nelson, Michael Griffin Sur. S.D. 1,208 ft.

Bexar County

Fred Beatty No. 1 Joppich, Iginio Tejado Sur. No. 186. Drlg. 639 ft.

H. G. Krumm No. 1 Kempf, Samuel McCollough, Jr., Sur. 54. T.D. 770 ft.; tstd. small amt. of oil; reworking well.

L. L. Skaggs No. 1 Braubach, Fernando Rodriquez Sur. Drlg. 239 ft.

Joe Wagner et al No. 1 Florence Lamm, Manuel De Luna Sur. Drlg. sh. 836 ft.

Blanco County

E. L. Nixon No. 2 Crist, John McClenechen Sur. No. 94. S.D. 210 ft.

Brooks County

Humble O. & R. Co. No. 4 McGill Bros., LaBlanca gr., 1,866 ft. N of No. 1. T.D. 4,725 ft.; tstg.

Southern Minerals Corp. No. 1 Proctor, Fel Furriaes Farm & Garden Tracts. O.W.D.D.; T.D. 7,726 ft.; P.B. 6,880 ft.; perf. csg. 6,855-70 ft., 6,553-68 ft. and 6,353-68 ft.; D.S.T. showed S.W.; pulling csg. to abd.

Comal County

O. W. Killam No. 1 Gruene, Henry Foster Sur. T.D. 1,109 ft.; D.S. stk.

De Witt County

Richardson et al No. 1 W. D. McCurdy, John Hunt Sur. T.D. 150 ft.

Duval County

Dan Auld et al No. 1 Pope Dimitt, Jose Marcelo Ynojosa gr. Loc.

J. W. Cosner et al No. 1 Cantu, Geraro Briones Sur. T.D. 5,807 ft.; abd.

C. G. Glasscock No. 1 Nicholas Garcia, Santa Cruz De Concepcion gr. S.D. 3,920 ft.

Gravis and Doran No. 1 Parr, San Andres gr., 1 mi. N of Sweden field Cg. sd. 5,916 ft.

Frank Gravis No. 3 Schallert, Seale, Morris & Seale Sur. No. 2550. T.D. 3,168 ft.; P.B. 1,800 ft.; prep. to sdtrk.

Hamill & Smith No. 1 Perez, Cordente Hrs. T.D. 3,114 ft.; S.D.

Hamill & Smith No. 1 A. Well, B.S.&F. Sur., Sec. 567. R.U.

Lanning & Coffield et al No. 1 W. T. Peters, C.C.S.D. Co. Sur. No. 66. Loc.

Magnolia Pet. Co. No. 1 Denman, Santos Garcia gr. Loc.

H. J. Porter et al No. 1-B Clara Driscoll,

Rosa G. Gray Sur. Drlg. sh. 1,510 ft.
Porter and Blanchard No. 1 Yates, John Gray Sur. T.D. 3,910 ft.; abd.
W. A. Wagner No. 1 D. J. Weikel, John H. Gibson Sur. No. 497. R.U. and S.D.

Goliad County

Martex Oil Co. No. 1 Wm. F. Albrecht, Thos. Hancock Sur. Spd.

Gonzales County

Otton Elder No. 1 Wilkinson, Russell Ward Sur. S.D. 425 ft.
Hochheim Dev. Trust No. 1 Dubose, E. G. Coffman Sur. 10-in. csg. 37 ft.; S.D. 2,509 ft.

Guadalupe County

Frank Glenn No. 1 Appling, Harriet Cottle Sur. No. 14. T.D. 2,218 ft.; tstg. 2,130-37 ft.; 7-in. csg. 1,960 ft.; R.U. to pmp.; S.D.; swbd. S.S.O.
John Hueners No. 1 Boecker, John Baker Sur. No. 26. Drlg. sh. 310 ft.
E. A. Weyel No. 1 Schraffel, R. B. White Sur. T.D. 753 ft.; abd.
R. A. Williams No. 1 Weber, Guadalupe Torres Sur. T.D. 1,483 ft. (cor.); 4½-in. csg. 1,468 ft.; S.D.

Hidalgo County

Pan American Prod. Co. No. 1 J. De la Vina Vicente Hinojosa gr. T.D. 8,125 ft.; P.B. 6,391 ft.; D.S.T. 7,985-8,023 ft.; tstd. S.W.

Jim Hogg County

Humble O. & R. Co. No. 7 Bass, San Raphel gr. T.D. 4,734 ft.; flwg. gas; no show of oil.
Humble O. & R. Co. No. 1 Mestena O. & G. Co., Fowler & Rankin subd., Palitos Blanco gr., R. G. Sars Sur. 16-in. csg. 70 ft.; T.D. 2,007 ft.; 10¾-in. csg. 1,563 ft.; drlg. sd. 3,676 ft.
Johnson & Robinson No. 1 Palacios, Mary Montgomery Sur. Cg. sdy. sh. 2,350 ft.
Johnson & Robinson No. 2 Palacios Est., Mary Montgomery Sur. No. 230. Cg. 390 ft.

Jim Wells County

F. A. Gillespie & Sons No. 1 Shear, Blk. 24, Adam Beatty & Moulton Sur. R.U.
H. H. Howell et al No. 1 W. T. Wright, Ross M. Bridges Sur. T.D. 6,800 ft.; well tried to blowout at 6,500 ft.; 5½-in. csg. 6,790 ft.; perf. csg. 6,644-48 ft.; tstd. S.W.; S.S.O.; T.P. 600 lbs.; C.P. 900 lbs.
H. H. Howell et al No. 2 Wright, A.&M. G.R.R. Sur. T.D. 3,942 ft.; abd.
Magnolia Pet. Co. No. 1 Samuel Maun, Los Olmos y Loma Blanca gr. 7-in. csg. 6,314 ft.; drlg. sh. 7,396 ft.
W. H. Mathews No. 1 Frances Clark, Los Precenos gr. 10¾-in. csg. 617 ft.; tstd. 450 lbs. press.; 1 qt. oil on D.S. T. 5,141-58 ft.; 5½-in. csg. 5,309 ft.; T.D. 5,319 ft. (cor.); perf. csg. 5,202-12 ft.; tstd. S.W.; perf. csg. 5,138-42 ft.; flwg. dist. and gas; ⅛-in. ck.

Kendall County

H. N. Reid No. 1 Marguardt, J. Travuso Sur. No. 150½. T.D. 992 ft.; abd.

Kenedy County

Humble O. & R. Co. No. 1 Kenedy rnh., Penaseal gr. R.U.

Kleberg County

Pure Oil Co. No. 1 State, Tr. No. 155, Drlg. sh. 4,937 ft.

Lavaca County

H. L. Edwards et al No. 1 Frank Rather, M. Wooten Sur. M.I.M.

Lee County

Fred Pederson et al No. 1 Brown, David Hudson Sur. T.D. 6,404 ft.; acd.; R.U. pmpd. 100 bbls. fluid; 36 hrs.; 3 bbls. oily emulsion, bal. S.W.; prep. to D.D.

Live Oak County

Bruce Albright No. 1 Texas Joint Stock Ld. Bnk., J. Poitevent Sur. No. 197. Loc.
Harry Hotchkin No. 1 Wade, J. Sommers Sur. No. 147. Cg. 1,001 ft.
L. W. Stieren No. 3 Lange, Thos. Adams Sur. T.D. 1,497 ft.

McMullen County

Boysen & Jones No. 1 Hagist, B.S.&F. Sur. No. 127. Cg. 1,996 ft.
Holbrook and O'Farrell No. 1 Miles, J. Poitevent Sur. Drlg. 736 ft.
Merle Morton No. 1 Valadez, Antonio De La Rosa, Porc 85. Loc.
Mid-Western Pet. Corp. No. 1 C. E. Byrne, Geo. Pittuck Sur. R.U.
C. D. Scarborough and Biglane No. 1 Paul Foyt, James Garner Sur. No. 6. Loc.
R. M. Strum and Womack No. 1 Smith and Leischner, A. Zumwalt Sur. S.D. 949 ft.

Medina County

John Clopton et al No. 1 T. A. Wilson, Wm. P. Scott Sur. Drlg. 50 ft.
J. I. and J. W. Cromwell No. 1 Tschirhart, I. J. Rogers Sur. No. 18. Drlg. 218 ft.
Gilcrease Oil Co. No. 1 W. S. Lilley, Abi Clark Sur. R.U.
Victor Ziegler No. 1 Paul Haby, Wm. G. Still Sur. No. 1. S.D. 875 ft.

Milam County

Alex Krause No. 1 Graves, Jackson Hall Sur. S.D. 900 ft.

Nueces County

H. D. & H. Oil Co. No. 1 Wright, V. L. De Herrera gr. Drlg. sh. 4,798 ft.
Heep Oil Corp. et al No. 1 G. W. Smith, Jose Vicente Lopez de Herrera gr. 10¾-in. csg. 1,090 ft.; T.D. 5,050 ft.; 7-in. csg. 5,049 ft.; perf. csg. 5,043-47 ft.; swbd.; no show.
Henshaw Bros. No. 1 Countiss, V. L. De Herrera gr. Drlg. sh. 3,736 ft.
O. W. Killam No. 1 J. O. Chapman, E. L. Rincon de Corpus Christi gr. Spd.
Republic Nat. Gas Co. No. 1 Robertson, Vincent Lopez de Herrera gr. 10-in. csg. 1,888 ft.; T.D. 5,525 ft.; 7-in. csg. 5,502 ft.; perf. csg. 5,298-5,308 ft.; tstd. mud; no show.
Seaboard Oil Co. No. 2 Wilson, Jose Vincente Lopez de Herrera Sur., Blk. 9. 13⅜-in. csg. 1,551 ft.; T.D. 5,037 ft.; 9⅝-in. csg. on bttm.; perf. csg. 4,994-97½ ft.; flwg. gas and wash wtr.; kld.; reperf. csg. 4,985-98 ft.; flwd. 50 bbls. P.L.O., 4 hrs.; ½-in. ck.; killed; reperf. csg. 4,996-99½ ft.; flwd. 81 B.P.D. 7/64-in. ck.; T.P. 1,275 lbs.; C.P. 1,650 lbs.
Shell Pet. Corp. No. 1 Griffith, Vicente Lopez de Herrera gr. Loc.

Real County

Blakely Smith et al No. 1 Love Ranch, H.E.&W.T.R.R. Co. Sur. S.D. 310 ft.

Refugio County

Copano Oil Co. No. 1-C O'Connor, Timothy Hoyt Sur. Cd. O.R. 5856-76 ft.; 5½-in. csg. on bttm.; perf. csg. 5,855-75 ft.; I.P. 356 B.P.D.; ¼-in. ck.; T.P. 1,250 lbs.; C.P. S.I. 1,800 lbs.; grav. 35.
Hewitt & Dougherty No. 1-B Rooke, Aldrete 6½ Lge. Drlg. sh. 4,836 ft.

San Patricio County

Coronado Corp. No. 9 Rooke, Aldrete 6¾ Lge. R.U.
Coronado Corp. No. 12 Rooke, Aldrete 6¾ Lge. R.U.
Culton et al No. 1 McCampbell, Peter Mahoney Sur. Drlg. sh. 3,863 ft.
Nueces Royalty Co. No. 1 Harries, J. Smith Sur. T.D. 6,310 ft.; abd.
Plymouth Oil Co. No. 1 Wilson, John Brown Sur. Drlg. sh. 2,510 ft.

Starr County

Banks Miller Oil Co. No. 1 Garcia, Juan Salinas Porc. 71. T.D. 682 ft.; abd.
Banks Miller Oil Co. No. 2 Garcia, Juan Salinas Por. No. 71. Drlg. sh. 70 ft.
Rhinehart and Bowman No. 1 Bowman, J. C. McCarty Sur. M.I.M.
Sun Oil Co. No. 4 McKinney, A. J. Smith Sur. No. 240. T.D. 5,382 ft.; perf. csg. 4,838-98 ft.; tstg.
Sun Oil Co. No. 1-B Montalvo, Los Retachez gr. T.D. 5,296 ft.; abd.
Sun Oil Co. No. 1 Olivarez, C.C.S.D.&R. G.N.G. Sur. Cg. sh. 4,807 ft.
W. W. Zimmerman No. 1 M. S. Tijerina, H.E.&W.T.R.R. Sur. No. 299. Cg. sh. 842 ft.

Travis County

Oscar Raesz et al No. 1 J. W. Swahn, Phillips McElroy Sur. No. 16. Drlg. sh. 265 ft.; no report.

Webb County

Houser & Campbell No. 1 Slator, Blk. 94 of Mission Oil Co. subd. of Jose B. Borego gr. T.D. 1,818 ft.; abd.
Magnolia Pet. Co. No. 2 Duval County Ranch Co., Duval County Sch. Ld. No. 101. T.D. 2,765 ft.; abd.
Smith & Storey No. 1 Houston Oil Co., R. O. Barnsley Sur. No. 24. Loc.

Williams County

Fritz Fuchs No. 1 Schmidt, J. West Sur. Drlg. 967 ft.; no report.

Zapata County

C. H. Lewis et al No. 1 Flores, Charco De La India gr. (cor.). T.D. 1,809 ft.; abd.

EAST TEXAS

(Border Counties)

Harrison County

F. H. Barnwell No. 1 Smith, A. P. Hope Sur. P.B. 2,425 ft.; tstd. dry; S.D.; W.O.

Marion County—Rodessa

Ark.-La. Gas Co. No. 2 Belcher, A. D. S. Coy Sur. Set 9⅝-in. csg. 1,022 ft.; drlg. sh.&L. 4,969 ft.
Gulf Oil Corp. No. 1 C. Ray, John Hanks Sur., NW cor., lse. R.U.
Harry Hanbury et al No. 2 Davis, Wm. R. Meyers Sur. Drlg. sh. 1,120 ft.

Marion County—Other

Tom Bell No. 1 Moseley, D. Lane Sur. Swbd. some oil; pig. tbg. 2,200 ft.
S. L. Fulton et al No. 1 Burks, G. Coor Sur. Spdg.
Van Horn & Clements No. 1 Berk, G. Coore Sur. R.U.

Sabine County

Hugo Allen No. 1 Brooks, Isaac Low Sur. S.D. 5,885 ft.; flows ⅛ to 3 bbls. 41-grav. oil and goes dead; C.P. 500 lbs.; will attempt to comp. as gas well.

WEST TEXAS WILDCATS

Andrews County

Atlantic and Standard No. 1-B Cowden, Sec. 1, Blk. 14, T.&P. Sur. Swbg. 4,160 ft.
Richmond Drlg. Co. No. 1 Bryant-Link Sec. 7, Blk. 48, P.S.L. Sur. D.&A. at 5,004 ft.
J. W. Tripplehorn No. 1 M. A. Thornberry, Sec. 2, Blk. 42-A. Pmpg. 8 B.O. P.D., 4,480 ft.

Borden County

Continental Oil No. 1 L. S. Monger, Sec. 38, Blk. 31, T.&P. Sur.; 4,000-ft. test. M.I.T.

Brewster County

H. D. Wilcox No. 2 Kokernot, Sec. 23, Blk. C, J. V. Massey Sur. Drlg. 40 ft.

Cochran County

T. G. Shaw, Tr., No. 1 Carrie S. Dean, Lge. 94. S.D.R. 4,979 ft.

Coke County

Barnett Pet. Co. No. 1 J. R. Mims, Sec. 39, Blk. W, T.&P. Sur. Temp. abd. 1,861 ft.

Concho County

Clymore Co., Inc., No. 1 Hill, J. Frederick Sur. No. 1694. Drlg. 860 ft.

Crane County

Great Western Prod. No. 1-B Univ., Sec 5, Blk. 30, Univ. Sur. Drlg. 2,705 ft.
Gulf Oil Corp. No. 5 M. B. McKnight Sec. 1, Blk. 21-B, P.S.L. Sur. Rng. 16-in. 215 ft.
Magnolia Pet. Co. No. 12 W. P. Edwards, Sec. 12, Blk. 23-B, P.S.L. Sur. Drlg. 3,194 ft.
Magnolia Pet. Co. No. 1-18 University, Sec. 18, Blk. 30, Univ. Sur. Drlg. 2,969 ft.
Standard O. of Texas No. 1-4 University, Sec. 4, Blk. 30, Univ. Sur. D.&A. 3,795 ft.

Crockett County

Hanson & Anderson No. 1 W. T. Knoelke, Sec. 30, Blk. GG, H.E.&W.T. Sur. Spd. and S.D.
Humble No. 1 Ozona-Barnhart, Sec. 4, Blk. M-N, G.S.&F. Sur. Cg. 3,440 ft.

Culberson County

Harry Niehaus No. 1 Caldwell, Blk. 109, Sec. 13, P.S.L. Sur. Drlg. 3,905 ft.
Quito Oil Co. No. 1 Cameron Lbr. Co., Sec. 24, Blk. 81, P.S.L. Sur. S.D.R. 945 ft.

Dawson County

Daw-Tex Oil No. 1 J. E. Neely, Sec. 28, Blk. 35, T.&P. Sur. Prep. cmt. 7-in. 4,369 ft.; swedging casg. 4,450 ft.

Dickens County

Bond D. Jones No. 1 Ford et al, I.&G.N. Sur. W.O. csg. 3,508 ft.
Humble O. & R. Co. No. 1 Matador Ld. & Cattle Co., Sec. 26, Blk. 1, Shock & Arnold Sur.; 6,000-ft. test. Drlg. 5,854 ft.

Ector County

R. R. Rhodes No. 1 J. L. Johnson, Sec. 43, Blk. 42, T.&P. Sur. Rng. 10-in. 225 ft.; no report.
Sinclair Prairie No. 1 Fay Holt, Sec. 1, Blk. A, P.S.L. Sur. W.O.C. 4,160 ft.

El Paso County

Tri-State Oil Co. No. 1 Kinkel. S.D. 3,571 ft.

Gaines County

Osage Drlg. Co. No. 1 E. H. Jones, Sec. 20, Blk. 7-A, P.S.L. Sur. M.I.M.

Garza County

Gulf Oil Corp. No. 1 Swanson, Sec. 25, Blk. 2, H.&G.N. Sur. Flwd. 148 B.O. in 9 hrs.; P.B. depth of 7,400 ft.; P.B. 6,821 ft.; tstd. S.W.; P.B. 6,134 ft.; tstg.; drld. out to 6,857 ft.; P.B. 6,296 ft.; swbg and tstg.

Glasscock County

B. A. Duffy No. 1 Carter-Shell, Sec. 8, Blk 33, T.&P. Sur. R.U.M.
J. R. Petty No. 1 Joe Blake, Sec. 163, Blk. 29, W.&N.W. Sur. Rng. csg. 200 ft.

Hockley County

S. W. Richardson No. 1 A. E. Coe, Lbr 53, Lge. 40, Maverick C.S.L. Sur. Cd. several zones of sat.; cg. 5.125 ft.

Howard County

Dick Graham No. 1 P. Johnson, Sec. 34, Blk. 32, T.&P. Sur. Loc.
T. G. Shaw, Tr., No. 1-B Wilkerson, Sec. 19, Blk. 34, T.&P. Sur. Drlg. 2,750 ft.

Hudspeth County

Haymon Kroupp Oil & Ld. Co. No. 1 Thaxton, SE¼ Sec. 34, Blk. 74, Twp. 6. Drlg. 5,673 ft.
Haymon Krupp No. 1 Briggs, Sec. 24, Blk. 73, Twp. 7, T.&P. Sur. W.O.C. 5,365 ft.

Irion County

Clyde Crabb No. 1 W. M. Boelke, Tom Green C.S.L. Sur. U.R. 10-in. 608 ft.; T.D. 1,270 ft.
J. W. Ellis No. 1 Sol Mayer, Sec. 240; Blk. 1, T.&P. Sur.; 2,100-ft. test. Lost hole, skidded 10 ft. east; drlg. 80 ft.

Lynn County

John L. Baldridge No. 1 Alma Lbr. Co., Sec. 151, H.E.&W.T. Sur. W.O.C. 4,450 ft.

Martin County

T. G. Shaw, Tr., No. 1 Wilkerson, Sec. 35-A, B.&C. Sur. S.D. 3,785 ft.

Pecos County

Geo. T. Abell No. 1 W. Williams, Sec. 11, Blk. 3, H.&T.C. Sur. Drlg. 45 ft.
Ben Dansby No. 1 L. C. Lessenich, Sec. 45, Blk. 9, H.&G.N. Sur. Drlg. 172 ft.
J. L. Green No. 1 Iowa Realty Tr., Sec. 139, Blk. 10, H.&G.N. Sur. Rng. 4-in. 1,040 ft.
O. E. Schade No. 1 Neville, Sec. 72, Blk. 194, G.C.&S.F. Sur.; 2,500-ft. test. Drlg. 2,447 ft.
O. E. Schade No. 1 Otis Garrett, Sec. 59½, Blk. 8, H.&G.N. Sur. Drlg. 1,564 ft.
Thomason Prod. Co. No. 1 Notions, Sec. 1, Blk. 105, W. P. Howard Sur. S.D. csg. 1,735 ft.
S. Thompson No. 1 Elsinore Cattle Co., Sec. 54, Blk. D, G.C.&S.F. Sur. Drlg. by whipstock 7,342 ft.
J. C. Trees No. 1 fee, Sec. 63, Blk. 8, H.&G.N. Sur. Drlg. 1,912 ft.

Reeves County

Artie Baker No. 1 J. W. Grider, Sec. 31, Blk. 58, P.S.L. Sur. S.D.R. 450 ft.

Schleicher County

Lone Star Gas Co. No. 1 Bert Page, Sec. 30, Blk. L, G.H.&S.A. Sur. Drlg. 2,456 ft.
Lone Star Gasoline Co. No. 2 Bert Page, Sec. 46, Blk. L, G.H.&S.A. Sur. Drlg. 1,915 ft.

Scurry County

Coffield & Guthrie No. 1 First Natl. Bk., Snyder, Sec. 29, Blk. 97, H.&T.C. Sur. W.O.C. 7-in. 2,018 ft.
Forest Dev. Co. No. 1 J. J. Koonsman, Sec. 217, Blk. 2, H.&T.C. Sur. D.&A. 5,004 ft.

Tom Green County

Dan Short et al No. 1 J. G. Davidson, NW part of Lovie P. Moore Sur. Loc.
Southern Cross No. 1 Upton & Upton, Sec. 20, Blk. A, A.B.&M. Sur. S.D.R. 100 ft.
Spinner No. 1 Reed, Mason Ferry Ranch Sur. W.O.C.; cave 4,948 ft.
Tom Green Oil Co. No. 1 Schreiber, A. Krending Sur. No. 1663. S.D. 1,000 ft.

Upton County

White & Wilson No. 1 Webb, Sec. 176, Blk. 1, C.C.S.D.&R.G.N.G. Sur. S.D.R. 715 ft.

Ward County

Robt. E. Mitchell No. 1 Allen, Sec. 7, Blk. 32, H.&T.C. Sur. P.B. 2,145 ft.; prep. shoot.

Winkler County

Standard Oil, Texas, No. 2 Baird, Sec. 13, Blk. 3-B, P.S.L. Sur. Drk.

Yoakum County

Honolulu Oil No. 10-695 R. Bennett, Sec. 695. Drlg. 5,107 ft.
Osage Drlg. Co. No. 1 Miller, Sec. 898, Gibson Sur. Drlg. 2,175 ft.
Shell Pet. Corp. No. 1 J. M. Rutts, Sec. 743. P.B. 5,229 ft.; 36 bbls. in 7 hrs.
Shell Pet. No. 1 Waples-Platter, Sec. 616. Drlg. 2,500 ft.
T. & P. Oil Co. No. 1 A. M. Brownfield, Sec. 802. No report, tight well.

TEXAS PANHANDLE

Collingsworth County

C. H. Mee and C. F. Anderson No. 1 V. K. McCaskill, Sec. 18, Blk. 16, H.&G. N. Sur. Drlg. 1,680 ft.
Johnson No. 1 Taylor. S.D. 875 ft.

Deaf Smith County

Uscan No. 1 Farwell. S.D. 5,650 ft.

Donley County

Robinson No. 1 Kuteman, Sec. 88, Blk. 20, H.&G.N. Sur. S.D. 4,406 ft.

Gray County

Products O. & G. Co. No. 1 Mason Davis, Sec. 23, Blk. 23-M, H.&G.N. Sur. Loc.
Tripplehorn No. 2 Webb, Sec. 12, Blk. A-9, H.&G.N. Sur. Cl. out 2,665 ft.

Lipscomb County

Darrouzett Oil Co. No. 1 Pugh, 1½ mi. S and 1 mi. W of Darrouzette. Drlg. 3,162 ft.

Potter County

Sinclair Prairie Oil Co. No. 1 Bush, Sec. 23, Blk. 6, B.S.&F. Sur., about 3 mi. N of Amarillo; 8,500-ft. test. S.D.R. 6,161 ft.

Roberts County

Whitlock No. 1 Cunningham. Drlg. 4,064 ft.

E. C. TEXAS WILDCATS

Cherokee County

C. C. Lanier No. 1 A. T. O'Neal, J. M. Procella Sur., 3 mi. E of Troup. Drlg. 1,810 ft.

Falls County

Marshall Hayes No. 1 M. Murphy, J. M. Sanches Sur., 2 mi. NE of Lott. W.O. S.R. 1,221 ft.

Grayson County

F. H. E. Oil No. 1 Graham, Chas. Quillen Sur., 1 mi. S of Collinsville. W.O.C. 3,905 ft.
John Grey No. 1 Freedman, W. S. Reeves Sur.; 8 mi. NW Denison. Loc.
Jim McMurrey No. 1 Dr. T. J. Long, J. Garland Sur., 2 mi. S of Collinsville; 4,000-ft. test. S.D.O. 3,929 ft.
Ross & Marshall No. 1 J. N. Taylor, W. Moore Sur., 8½ mi. NW of Denison. Loc.

Houston County

Cook & Mayo No. 1 C. A. Walling, B. Parker Sur., 4 mi. N of Grapeland. T.D. 6,077 ft.; prep. to test.
Leggett & Gossett No. 1 B. F. Gardner, J. Thorn Sur., just N of Weldon. R.U.

Kaufman County

Sam Knoerr No. 1 J. B. Hunter, P.

Walker Sur., 5 mi. S of Terrell. S.D. 40 ft.

W. G. McGee No. 1 General American Life Ins. Co., John Baker Sur., 6 mi. w of Mabank. Drk.

Limestone County

H. Gant No. 1 Vol De Long, P. Varela Sur., 1¼ mi. NW of Thelma. S.D. 2,924 ft.

McLennan County

C. E. Porter No. 1 B. D. Burchett, De la Vega Sur., just SE Waco. S.D. 695 ft.

Navarro County

Guy Sitton No. 1 J. P. Fortson, T. J. Chambers Sur., 4 mi. E of Alma. S.D. 628 ft.

Rains County

McKinley & Hastings No. 1 McTaggert, B. Milder Sur., 1 mi. W of Emory. S.D. 30 ft.

Red River County

Bentley-Sheppard & Stevens No. 1 So. Pine Lbr. Co., G. S. Parks Sur., 17 mi. N of Clarksville. S.D. 71 ft.

Smith County

R. W. Rair No. 1 Clark, J. Lewis Sur., 2 mi. W Mt. Sylvan. R.U.

J. H. Thomason No. 1 J. W. Bartlett, R. H. Stewart Sur., ¼ mi. SE of Jamestown. S.D. 1,869 ft.

Trinity County

C. D. Davis No. 1 J. D. Gibson, A. Donavan Sur., 4 mi. NE of Trinity. Gas blowout 148 ft.; S.D. 2,627 ft.

Upshur County

R. E. L. Johnson No. 1 Lizzie Parker, John B. Gay Sur. Rng. S.L.M. 3,428 ft.

Van Zandt County

F. A. Richardson No. 1-A B. C. Dodd, T. W. Hutchinson Sur., 2 mi. S of Grand Saline. S.D. 1,925 ft.

Wood County

Geo. Strake No. 1 Farrier, J. Walker Sur., 4 mi. E of Yantis. R.U.

NORTH TEXAS WILDCATS

Archer County

Birdwell Oil Co. No. 31-B Oil Inv. Co., Lot 2, John Richards Sur., 5 mi. NW of Archer City; 4,200-ft. test. Drlg. 3,800 ft.

W. B. Omohundro No. 1 T. B. Wilson, Sec. 5, H.&T.C. Sur. S.D.O. 4,502 ft.

Phillips Pet Co. No. 1 J. B. Miller, Sec. 20, A.T.N.C.L. Sur. T.D. 4,006 ft.; O. W.D.D.; S.O. to D.D. to 4,500 ft.; C.O. 3,800 ft.

Westmount Oil Co. No. 7 T. J. Dempsey, Sec. 10, D.C.S.L. Sur., O.W.D.D. Perf. csg. 4,139-44 ft.; S.D.O.

Baylor County

British Am. O. P. Co. No. 1 J. E. Cope, Sec. 220, T.&N.O. Sur. Drlg. 2,472 ft.

Clay County

L. T. Burns No. 1 Browning, Sec. 94, Belcher subd.; 5,000-ft. test. Drlg. 4,225 ft.

Cooke County

Sinclair Prairie No. 3 J. M. Best, T. Toby Sur. A-1054. 6⅝-in. csg. 4,925 ft.; O.S. 4,925-47 ft.; tstg.

Foard County

Fleetwood & Kaufman No. 1 Prowers, H.&T.C. Sur., Blk. A. S.D.O. 5,005 ft.

Jack County

Pitzer & West No. 1 F. Warren, Sec. 2784, T.E.&L. Sur. Drlg. 3,170 ft.

Montague County

Benton & Holmes No. 1 J. Bowers, Sec. 55, M.E.P.&P. Sur. S.S.O. 2,887-95 ft.; 6⅝-in. 2,883 ft.; tstg. est. 500 to 600 B.P.D.

Wichita County

F. S. Freeland No. 1 J. D. Cooper, H. Hastie A-92; 4,000-ft. test. Spd. and S.D.

Wise County

H. Jackson No. 1 F. Neeley, Blk. 29, Matagorda Co. Sch. Ld. Spd. and S.D.

H. M. Muse No. 1 F. F. Kaker, Blk. 16, Matagorda Co. Sch. Lds. Plts.

Wilbarger County

Lawson & Leavell No. 16 W. T. Waggoner A, Sec. 109, H.&T.C. Sur., Blk. 14. Matl. 3,500-ft. test. Spd. and S.D.

Humble O. & R. Co. No. 1 T. J. Milner, Sec. 31, H.&T.C. Sur., Blk. 9; 3,000-ft rotary test; S.S.O. 1,096-1,106 ft.; S.D. 2,990 ft.

Young County

Brader & Groves No. 1 J. L. Clark, Sec. 2, E.L.&R.R. Sur. 6⅝-in. 3,850 ft.; O.S. 3,850-60 ft.; est. 200 bbls.; tstg.

H. M. Leidecker No. 1 J. M. Nall, Sec. 1997, T.E.&L. Sur. S.D. 1,515 ft.

Long & Lupton No. 1 A. Crouch, I.&G. N. Sur. A-1460. 6⅝-in. 3,865 ft.; sat. L. 3,940-44 ft.; treating with acid; test wtr.; S.D.O.

Magnus & McLester No. 1 B. B. Teague, E. S. Colthrop Sur. A-1390. 6⅝-in. 3,786 ft.; G.L. 3,780-3,825 ft.; treating with 6,000 gal. acd.; est. 200 bbls.; S. D.O.; est 10 B.P.D.; may D.D.

WEST CENTRAL TEXAS DISTRICT

Brown County

A. D. Bruce No. 1 L. J. Mauldin, Sec. 15, H.&T.C. Sur. Spd. and S.D.

E. C. Norman No. 1 Stella Rice, Chas. Messenger Sur. No. 127. S.D.R. 981 ft.

Callahan County

Dobbs Oil Co. No. 1 Finley, Sec. 75, Bayland Orphans Home Ld. Fsg. 1,785 ft.

J. C. Jackson and Doug. Tomlingson, Jr., No. 1 T. J. Thompson, Sec. 30, B.B.B. &C. Sur. Drlg. 1,875 ft.

Roeser & Pendleton No. 1 Chas. Yost, Sec. 18, Blk. 8, S.P. Sur. D.&A. at 4,829 ft.

Coleman County

Arcadia Ref. Co. No. 1 W. R. Roberts, D. J. Holt Sur. S.D.O. 3,342 ft.

E. E. Kirkpatrick No. 1 F. Nixon, Burnett, C.S.L. Sur. Drlg. 2,810 ft.

Comanche County

Comanche O. & G. Co. No. 1 J. E. McGuire, C. Rockefeller Sur. No. 3. S.D.O. 2,910 ft.

E. T. DeArman No. 1 Moorman, Sec. 37, D.&D.A. Sur. Rng. csg. 2,505 ft.

Eastland County

Dobbs Oil Co. No. 1 Greer, J. E. Hardy Sur., Ellenburger test. Drlg. 2,100 ft.

Vin Gamblen No. 1 G. C. Daniels, Sec. 2, B.B.B.&C. Sur. D.&A. 448 ft.

Kleiner & Warren No. 1 Harbin, Sec. 1, Blk. 6, E.T.R.R. Sur. D.&A. 1,640 ft.

Hamilton County

Wallace & Vickers No. 1 C. C. Lund, J. P. Bailey Sur. 51. Drlg. 2,390 ft.

Haskell County

Sawyer Drlg. Co. No. 1 A. J. Rowland Est., Sec. 5, Blk. 3, H.&T.C. Sur., 15 mi. E of Stamford. S.D.O. 5,120 ft.

Hood County

Prince & Miller No. 1 J. H. Andrews, NW cor. of Geo. Sutherland Sur. S.D. 615 ft.

Jones County

Brown Eagle No. 1 Waterson, Andrews Sur. No. 191. T.D. 2,283 ft.; S.D.

R. B. Carrol No. 1 G. Herndon, Goliad C.S.L. Sur. Drlg. 2,200 ft.

Ed. L. Evans No. 1 B. J. Crier, Sec. 8, B.A.L. Sur. U.R. 1,469 ft.

G. M. Gillispie No. 1, Sec. 54, O.A.L. Sur. Drlg. 120 ft.

Grover, Rose & Farrell No. 1 O. D. Swanson, Sec. 193, B.B.B.&C. Sur., 2 mi. NE of Avoca. D.&A. 3,271 ft.

J. H. Sproules No. 1 James Nichols, Sec. 47, Blk. 16, T.&P. Sur. Tstg. 1,798 ft.; est. 15 B.O.P.D.

Nolan County

Chas. E. Peddicord No. 1 Tipton, Sec. 43, Blk. 19, T.&P. Sur. S.D. 2,927 ft.

Union Oil Co. No. 1 J. D. Pepper, Sec. 51, Blk. 21, T.&P. Sur.; 5,000-ft. test. 6 mi. SW Sweetwater. Drlg. 5,660 ft.

Palo Pinto County

W. K. Gordon No. 1 J. W. Conway, Ruidosa I.R.R. Sur. Drlg. 65 ft.

Parker County

Brown-Gardner Bros. No. 1 Gilbert, T.& P. Sur., Abst. 1958. S.D. 2,200 ft.

Shackelford County

W. J. Dettenhaim No. 1 Mrs. F. J. Lynch, Sec. 24, B.A.L. Sur. Drlg. 235 ft.

Fox & Rudd No. 1 Shotwell, Sec. 59, B.A.L. Sur. Fsg. 1,632 ft.

R. H. Gordon and Frank Pethybridge No. 1 C. B. Synder, 330 ft. fr. N and E lines, Sec. 38, L.A.L. Sur.; 4,500-ft. test. Est. 20 to 50 B.O.P.D.; T.D. 3,660 ft.; S.D. 4,293 ft.

Taylor County

Forest Dev. Co. No. 1 Anderson, Sec. 8, L.A.L. Sur. D.&A. 3,546 ft.

THOMPSON

(Continued from Page 47)

course, upon their ability to produce without waste. If this were done every state would produce in the proportion that its reserves bore to the total reserves of the nation. If a state had 20 per cent of the reserves it would produce 20 per cent of the needed daily allowable. As a state built up reserves it would gradually build up markets. As a state's reserves were depleted its allowable would drop. This would more nearly approximate true competitive conditions which would be in effect were proration not in vogue. Texas today has 53 per cent of the reserves, and is producing 38 per cent of the market.

If we keep on drilling wells too close together I believe it will break all except the most powerful financially. I know it is not fair to make people drill wells and then have no market for the oil. The operator meets himself coming back. He digs more wells to make up his constantly decreasing income from constantly reduced allowables until finally he may find himself with so much money invested that the income cannot take care of interest and operating costs.

Much fiction has crept into our figures on our ability to produce. Because of proration potentials have been permitted to go practically unchallenged.

For example: A well is acidized and shot before being completed. A short test is then made for its potential rating to be used in calculating its daily allowable production. Naturally the operator, his bankers, the royalty owners and all concerned desire as big an allowable as possible.

This goes on and on and we build up an unchallenged array of so-called potentials. Potentials would be deflated surprisingly if it were possible to lift proration for a time, area by area, and let the wells prove their ability to produce, and particularly to produce without waste. It would go far toward preventing incorrect drilling.

In still another way the arrangement is unsatisfactory to the producing branch. The incentive that causes the producer to hold down production to the market demand is the expectation of a fair price for his product. Instead of stability, however, in 1938 he got a price cut. During 1938 the aboveground storage of crude was reduced 30 million barrels. There is not now too much crude in storage and production currently is in almost perfect balance with demand.

The refining end of the business is in immediate need of some practical business statesmanship. It is not regulated and is running wild.

Careful study of the needs for the six months' period ending March 31, 1939, indicates that there should not have been refined more than 3,100,000 bbls. of oil per day. During the week of January 21 the industry ran to stills 3,310,000 bbls. daily. This is possibly 200,000 bbls. per day more crude than should have been refined. It is hoped that the inventory on March 31 will show not more than 83,000,000 bbls. of gasoline on hand. I am appealing to the refiners to help consolidate the gains that have been made by the producers. Ten million barrels of excess gasoline will do much more harm to the market than 20,000,000 bbls. of excess crude in storage. The efforts of the producers to protect the market are useless unless the refiner does his part.

Before closing I should like to call attention to the responsibility that rests upon those whose duty it is to give direction to, and supply leadership for, the oil industry, to find the solution of this problem of proration. This responsibility rests not only on the business leaders, but on the governors, legislators and the administrators of the oil-producing states. Anything less than our best efforts will be a betrayal of trust.

Our failure will have profound public consequence. There will be the losses in public revenues and the effects on the general business conditions. This can easily result to legislation that will go far beyond necessary correction, and may completely change the oil business as we now know it.

The solution is to have wider spacing between oil wells. Do not put them so close together. This will mean we can produce all of the oil that is needed without so many wells. This will mean the oil will be produced with less cost and a greater return on investments. Oil loans when made with due care are still good investments—perhaps the best.

It's a Keystone You Want,

. . . If you are interested in a good drilling machine; a good cleaning out machine; or general purpose machine.

Advise us of your needs, we'll gladly quote you on suitable equipment.

There are Keystone portable machines for all work to 4,000 ft.

Keystone Driller Co.
BEAVER FALLS, PA.
Joplin, Mo. Waukegan, Ill. Arlington, N. J.

Personal Paragraphs

E. F. SPRINGER, Fort Worth, Tex., operator, and Mrs. Springer have a new daughter.

RALPH MASON, industrial relations department, and ROBERT ROESSLE, foreign personnel department, Standard Oil Co. of New Jersey, sailed from New York February 17 for Curacao.

DORSEY HAGER, consulting geologist and author, Centralia, Ill., gave a talk before the St. Louis Electrical Board of Trade February 14, in the Hotel Statler, on "Oil, the New Lifeblood of Southern Illinois and Northwest Missouri." Mr. Hager evaluated the new developments in northern Missouri and Illinois and explained the simpler geological and geophysical processes.

E. R. SLOAN, who resigned February 15 as chairman of the Kansas Corporation Commission, has been retained as legal counsel by the Phillips Petroleum Co. Mr. Sloan, who was to have left the commission March 20, advanced the date in order to represent Phillips during the current Kansas legislative session.

FRANK MORGAN, manager of exploration and vice president of the Richfield Oil Corp., and HAROLD HOOTS, chief geologist, put on a sketch which almost disrupted the regular monthly meeting of the A.I.M.E. in Los Angeles last week. It purported to show how oil should be found in California through use of a willow fork. BOB MORAN told of his recent trip to Peru and the upper Amazon.

EDISON TURPIN is the new president of Tarrant Petroleum Retailers, Inc., succeeding R. E. H. GAEDKE. Mr. Turpin, in business in Fort Worth 12 years, is a graduate of North Texas Teachers College at Denton.

DAN HOGAN was elected president of the San Joaquin Valley Oil Producers at the recent annual meeting in Bakersfield, Calif. ALLEN JERGINS was chosen vice president and THOMAS McMANUS secretary.

JOHN R. SUMAN, vice president of Humble Oil & Refining Co., Houston, Tex., while attending the annual meeting of the A.I.M.E. in New York, was called suddenly to California by the death of his father. He made the trip by airplane.

CHARLES U. BAY, New York, was elected president of the Bay Petroleum Corp., Denver, Colo., at a recent meeting of the board of directors in the latter city. ROLAND V. RODMAN was chosen vice president and general manager; DENT N. HAND secretary-treasurer, W. R. NEWMAN general superintendent, L. L. LEABO sales manager of the Denver and Cheyenne divisions, M. C. BRADSHAW sales manager of the McPherson division and ED M. CATRON production superintendent. The resignations of M. H. ROBINEAU as president and of H. E. ARMITAGE as secretary were accepted. The company has refineries in Denver, Cheyenne, Wyo., and McPherson, Kans.

PAT RUTHERFORD, drilling contractor and producer of Houston, Tex., has returned to that city after an extended stay in California.

J. PATRICK D'ARTOIS, attorney for the Ohio Oil Co. in Shreveport, La., is instructing night classes in the law of oil and gas at Centenary College for the spring semester.

J. M. KUNKLE, district credit supervisor for the Union Oil Co. of California in San Diego for several years, has been transferred to Los Angeles and appointed supervisor in the office of the general credit manager. He is succeeded in San Diego by HAROLD TEMPLE.

MAJ. J. R. PARTEN, president of the Woodley Petroleum Co., Houston, Tex., will be chairman for the board of regents of the University of Texas for the next two years. A second oil man on the board is DR. GEORGE D. MORGAN, of San Angelo, chairman of the lands committee and school of mines committee.

HAL E. REDMON, in charge of land and geological operations for the National Refining Co., Cleveland, Ohio, for eight years, has been promoted to superintendent of exploration in the territory west of the Mississippi River. Mr. Redmon, with headquarters in Wichita, Kans., will have charge of five departments, including land and lease, geological, geophysical, scouting and consulting production engineering. O. W. GOSNELL, Russell, western Kansas production superintendent, has been promoted to superintendent of production in Kansas.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

The gross production tax in Oklahoma, three-quarters of 1 per cent per barrel, has been declared inoperative by the supreme court, which decision makes the old tax of one-half of 1 per cent again the law of the state.

The Standard Oil Co. of California, with a capital of $4,493,399.40, reports net earnings for 1913 of $19,336,140.46. It paid 10 per cent in dividends, and added $14,892,741.06 to its surplus during the year.

20 YEARS AGO

David O. Holbrook, secretary-treasurer of the Natural Gas Association of America, dies in Pittsburgh, Pa., on February 15.

Jackson Barnett, millionaire illiterate Creek Indian, has an income of $1,000 per day from royalties on his allotment in the Cushing, Okla., field. Barnett owns $704,000 in liberty bonds; $483,000 cash in banks; $150,000 in 8 per cent loans, and "then some."

James H. Alexander, 84, retired vice president of the Standard Oil Co. of New Jersey, dies in Elizabeth, N. J.

10 YEARS AGO

E. H. Salrin has been elected president of Tidal Oil Co., advancing from vice president in charge of the land department.

Walter M. Dunham, widely known oil statistician, dies in Dallas, Tex.

William N. Davis, president of the Mid-Continent Oil and Gas Association, makes public a tentative plan for the pooling of acreage in prospective oil fields and unitized development and production of such fields.

EDWARD M. FREEMAN, Houston, Tex., member of the Texas Co. executive offices, has been promoted to the general offices in New York.

ARTHUR E. PEW, JR., of Sun Oil Co., Philadelphia, Pa., has been appointed chairman of the American Petroleum Institute's 1939 committee on standardization of refinery equipment.

A. F. COOK has been appointed advertising manager of the Association of Gas Appliance and Equipment Manufacturers, New York. Mr. Cook for the past 10 years was assistant advertising manager of the Philgas department of the Phillips Petroleum Co., in Detroit, Mich.

THAD O. DAY, San Antonio, Tex., an independent operator active in the Lerado area and elsewhere in Southwest Texas, left last week for a visit to the Illinois fields. He planned to return by way of the southeastern New Mexico area. He was connected with Wiser Oil Co. in Bartlesville, Okla., for 12 years before moving to San Antonio in 1936.

DEWEY LOUCKS, of New York, chairman of the board of directors of the Barnsdall Oil Co., and E. B. REESER, of Tulsa, president, headed a group of officials and directors on a tour of the company's holdings in South Texas the past week. Included in the party were R. A. BROOMFIELD, of Los Angeles, director and vice president; JAMES A. DUNN, of New York, vice president and secretary; D. L. FRAWLEY, of Pittsburgh, vice president, and D. R. SNOW, of Tulsa, vice president and general manager.

SAM DUNNAM, JR., independent operator of Houston, Tex., has returned from a vacation in Miami, Fla.

BILL GWINN, geologist with the Standard Oil Co. of Louisiana in Shreveport, will sail soon for Iraq, where he will be stationed for two years with the Iraq Petroleum Co.

A. K. TYSON, Houston, Tex., chief geologist for the Continental Oil Co. in the Gulf Coast district, and MISS KATHERINE ARCHER were married in Austin February 11.

T. J. DONOGHUE, executive vice president of the Texas Co., Houston, Tex., has returned from a trip of several weeks in South and Central America. He visited Colombia, Venezuela, and Panama.

FRANKLIN S. WADE, president of the Southern Counties Gas Co., was elected a director of the State Mutual Building and Loan Association at the regular annual meeting held in Los Angeles last week. He succeeds his brother, C. H. Wade, who was president of the association until his recent death. C. H. Wade had succeeded his father, C. J. Wade as president, and thus for more than 40 years there has been a Wade as either president or director of the association.

WILLIAM K. COTTRELL, since 1934 auditor and examiner with the Oklahoma Tax Commission, has been elected secretary-treasurer of the East Texas Refining Co., of which FREEMAN W. BURFORD is president. A native of Arkansas, Mr. Cottrell entered the oil business as chief accountant for the Cosden Oil Co. Later he was associated with Tide Water Associated Oil Co. as comptroller and with the Oklahoma Natural Gas Co. as secretary-treasurer.

Three Years Enough

Three years of teaching was enough for D. R. Snow, so he joined the old Waite Phillips Oil Co. in Tulsa and soon was chief geologist. When the company was acquired by the Barnsdall Oil Co. in 1926 Mr. Snow went with it. Two years later he was promoted to manager of the land and geology department. In 1932 he was elected vice president in charge of land and geology. Further advancement came in 1935, when he was made vice president, general manager, and a director.

D. R. SNOW

Mr. Snow was born in Fayette, Ohio, in 1893, and from the schools of that little town he entered Ohio Wesleyan University. Two years later he shifted to University of Chicago, where he received his bachelor of science in geology in 1916, having completed four years' work in three. His first year out of college was spent in the geological department of the Roxana Petroleum Corp. Then two things happened: (1) He married Miss Rachel Ott, a classmate at Chicago University. (2) He quit oil and began teaching in Tulsa Central High School, where he established the department of geology. In 1920 he returned to oil.

Canoeing and swimming are favorite diversions of Mr. Snow. By way of a hobby he has several farms in Oklahoma. He doesn't say much about them as revenue producers, but insists he has a lot of fun. He is president of the Tulsa Ozark Club, a member of the Southern Hills Country Club and is active in technical organizations.

JUDGE E. H. FOSTER, head of the Phillips Petroleum Co.'s legal department in the Amarillo, Tex., offices, has been made a director of the Mid-Continent Oil and Gas Association.

HAYS SIMPSON, scout for Sinclair Prairie Oil Co. in the Seminole, Okla., district, has been transferred to Evansville, Ind. He delayed his departure until after the arrival of a new daughter last week.

DR. R. W. BRAUCHLI, head of the land department, and HAROLD KELLER, district land man, for the South Texas area of the Anderson-Prichard Oil Corp., Oklahoma City, are in Houston, Tex., watching development along the newly opened Sparta-Wilcox trend.

LEROY D. KILEY, president of the Mitchell Oil Corp., Mamaroneck, N. Y., was chairman of the committee in charge of the annual dinner dance held Tuesday of this week at the Astor Hall by the Westchester Oil Trades Association. This was the ninth affair given by the Westchester group, one of the oldest organized oil associations in the Greater New York area, but previous ones have been stag. There were about 400 reservations.

J. C. HUNTER, independent producer of Abilene, has been appointed chairman of the Texas Highway Commission by GOVERNOR W. LEE O'DANIEL. Mr. Hunter was one of the earliest champions of good roads in West Texas. He got the first appropriation for county road construction after establishment of the state Highway Commission in 1917. He was county judge of Culberson County at the time. He is president of the Abilene Chamber of Commerce, director of the West Texas Chamber of Commerce, and director of the Citizens National Bank of Abilene.

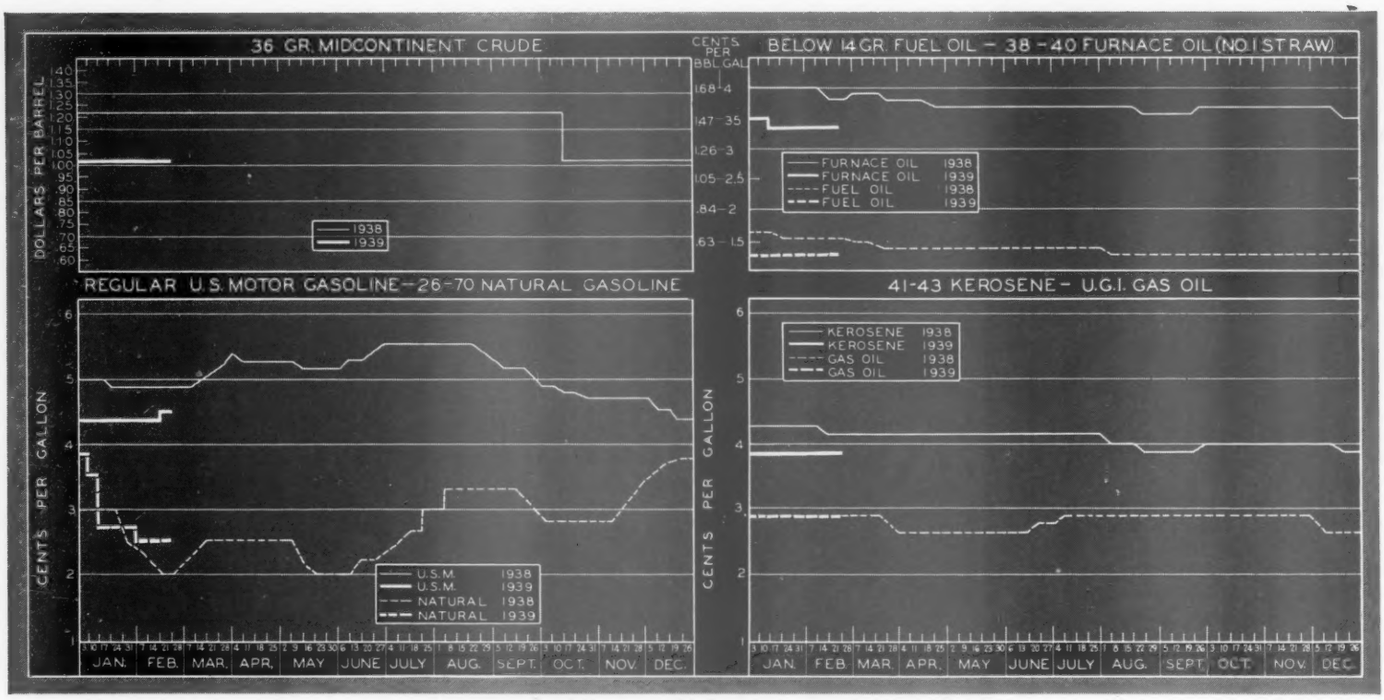
SHIFTS: R. S. McBRIDE, producer, from Salem, Ore., to Portland, Ore.; R. M. HAMMOND, drilling contractor, from Plattsburg, Mo., to Golden, Colo.; CARL A. MAPES, engineer the Texas Co., from Dallas, Tex., to Baltimore, Md.; C. K. PORTER, engineer, from Houston, Tex., to Blue Island, Ill.; W. H. VERNOR, producer, from Houston, Tex., to Washington, D. C.; R. J. STEEL, geologist I. T. I. O. Co., from Midland, Tex., to Eastland, Tex.; R. RANNE, Ranne Refining Co., from Overton, Tex., to San Antonio, Tex.; FRED C. SEIBOLDT, drilling contractor, from Wichita Falls, Tex., to Graham, Tex.; SAMUEL W. TAIT, JR., producer, from Mineral Wells, Tex., to San Antonio, Tex.; L. F. SHIPLET, superintendent the Texas Co., from Wink, Tex., to Midland, Tex.; DAN McQUEEN, drilling contractor, from Centralia, Ill., to Stewardson, Ill.; JULES ALFORD, Jules Drilling Co., from Centralia, Ill., to Montgomery, Ala.; R. V. DILLARD, drilling contractor, from Salem, Ill., to Tulsa; ANATOLE SAFONOV, geologist Ohio Oil Co., from Ardmore, Okla., to St. Joseph, Mo.; R. R. CREEKMORE, engineer Oklahoma Pipe Line Co., from Seminole, Okla., to Wewoka, Okla.; F. E. BUCHAN, chemist Pure Oil Co., from Winnetka, Ill., to Chicago; A. E. CHEYNE, geologist Ohio Oil Co., from Wichita, Kans., to St. Joseph, Mo.; H. L. CROCKETT, geologist Ohio Oil Co., from Great Bend, Kans., to Bethany, Mo.; B. B. BRALY, JR., superintendent Barnsdall Oil Co., from Tulsa to Corpus Christi, Tex.; W. H. RINEHART, Iraq Petroleum Co., Ltd., from Haifa, Palestine, to Deir-el-zor, Syria.

J. C. ANDERSON, of the Anderson Drilling Co., Long Beach, Calif., announced that plans have been completed for a deep rotary test on the Charles Ott ranch in the North Piney district of Sublette County, Wyoming. Work is scheduled to begin about May 1. Offices for the Wyoming operations will be established in Big Piney, Wyo.

W. E. CHARFANT, Ohio Oil Co., West Texas division, is instructor of a class of elementary oil-field arithmetic sponsored jointly by the vocation division of the Texas State Department of Education and the American Petroleum Institute at an oil-field school held twice a week in Iraan, West Texas. HAROLD WILLIAMS, Gulf Oil Corp., is teaching advanced oil-field mathematics, and H. W. MATHEWS, Standard Oil Co. of Texas, production practices.

DR. GUSTAV EGLOFF, of the Universal Oil Products Co., Chicago, will be the speaker in Bradford, Pa., Tuesday, February 28, before the Bradford group of the National Petroleum Association's department of manufacture. The departments of manufacture and of standards and tests will attend.

JUDGE R. H. FOSTER, executive vice president of the Landreth Production Corp., Fort Worth, Tex., was chosen chairman of the new transportation study committee of the Independent Petroleum Association of America. The other members of the committee are E. C. MORIARTY, vice president Derby Oil Co., Wichita, Kans.; C. H. WRIGHT, Sunray Oil Co., Tulsa; EARL D. WALLACE, president Kentucky Oil and Gas Association, Lexington, Ky., and R. F. WINDFOHR, vice president Nash & Windfohr Oil Corp., Fort Worth, Tex. EDWIN B. HOPKINS, vice president of the American-Maracaibo Co., Dallas, Tex., will be chairman of the subcommittee on unnecessary and unprofitable drilling, taking the place of R. A. KING, president of the King Oil Co., Wichita Falls, Tex., who continues as a member of the subcommittee. A. S. RITCHIE, president of the McPherson Drilling Co., Wichita, Kans., is vice chairman.


36 GR. MIDCONTINENT CRUDE
DOLLARS PER BARREL
1938
1939
CENTS PER BBL. GAL
BELOW 14 GR. FUEL OIL – 38 – 40 FURNACE OIL (NO. 1 STRAW)
FURNACE OIL 1938
FURNACE OIL 1939
FUEL OIL 1938
FUEL OIL 1939
REGULAR U.S. MOTOR GASOLINE – 26 – 70 NATURAL GASOLINE
CENTS PER GALLON
U.S.M. 1938
U.S.M. 1939
NATURAL 1938
NATURAL 1939
41-43 KEROSENE – U.G.I. GAS OIL
KEROSENE 1938
KEROSENE 1939
GAS OIL 1938
GAS OIL 1939
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Group 3 Gasoline on Firmer Ground and Heating Oils Slightly Steadier

By T. F. SMILEY

Gasoline continued its upward swing to firmer levels in the Group 3 market during the past week. Heating oils, though still nervous, were looking a little better, but not enough to affect quotations. The naturals were holding their ground.

Notwithstanding the disturbing rate of increase in the country's gasoline stocks, a definitely improved feeling was evident in the Mid-Continent territory, and a seller's market prevailed. Some companies have less material in storage than they had a year ago, and according to reports they are not finding it easy to build up their inventories to the volume needed for the heavy consuming season ahead. Other companies obviously are adding substantially to storage.

Sellers Become Buyers

The shrinkage in gasoline offerings in the Mid-Continent has brought about some unexpected changes of front. One refinery, for instance, which usually is looking around for outlets, not only cleaned up its own stock in the past week or so, but after scurrying around it bought 100 cars needed to meet contracts. Some large companies have been buying regularly, using part of the material to fill orders and storing the rest. Their action has had a firming effect on the market.

Some majors and semimajors, with retail outlets in Standard of Indiana territory, were reported to be buying regular-grade gasoline and blending it with low-octane material to produce a 67-octane fuel. Old third-grade (62-octane and below) was reported scarce.

Additions to total gasoline stocks in recent weeks have exceeded those in the corresponding weeks of 1938, something which observers agree does not point toward a healthy market when the vacation season opens.

A brightened corner in the refinery market was that occupied by the lubricants, which for more than a year have been subjects of savage price-cutting. Figures released by the Western Petroleum Refiners Association show that Mid-Continent refiners started the year with 71 days' supply of bright stock, compared with 86 days' supply one month earlier.

Refined Oil Market Barometer

Ascending stocks of gasoline cause concern as weekly additions continue to exceed the limits of probable requirements. Notwithstanding this unfavorable factor, the market generally is in better position than last week. Heating oil inventories in the Mid-Continent are assuming the proportions of a threat. Bright stock and neutrals are gaining strength. Naturals slightly firmer.

MID-CONTINENT. Gasoline stronger. Furnace oils holding. Lubricants improving.

EAST COAST. Gasoline steadier. Decline of heating oils interrupted by cold snap.

GULF COAST. Burning oils slow. General market dull. Prices fairly steady.

PENNSYLVANIA. Lubricating oils firmer, some prices up. Wax steady.

CALIFORNIA. Gas oil, Diesel and furnace oil soft. Market inactive.

CHICAGO. Gasoline steadier. Heating oils steadier, but stocks too large.

Mid-Continent shipments of bright stock in December, 1938, were more than double those in the same month of 1937. Shipments of neutrals scored a gain of 17 per cent. Production of bright stock in December, 1938, was 41½ per cent under that in the same month of 1937. Production of neutrals showed a drop of 3.3 per cent. In view of the fact that the lubricants have presented one of the sorest spots in the Mid-Continent market, these figures are regarded as encouraging.

Pickup in Natural Gasoline

Natural gasoline experienced a moderate pickup in both Oklahoma and Texas, with jobber buying more active. Cold weather had a tonic effect, starting rush orders for natural with which to pep up motor fuel designed for warmer weather. The flow of business to manufacturers who must make daily shipments was evidently enough to take care of their output, for there were no reports of really distress stocks.

Heating oils, which are a source of anxiety in the Mid-Continent, were less droopy this week, thanks to a series of brief cold waves which struck various districts. Prices, which recently looked as though they would break, were holding fairly well. Just the same, there is too much furnace oil in Mid-Continent tanks. While stocks of gas oil and distillates on the East Coast have shrunk to about half the volume recorded at the close of last November, those in the Mid-Continent have been almost static.

Some plants have started manufacture of tractor fuels in preparation for spring business, tending to put this material, along with kerosene, in a slightly better position.

Resistance to Downward Trend in Prices More Substantial

By H. STANLEY NORMAN

NEW YORK, Feb. 20.—Moderating temperatures along the North Atlantic seaboard, excepting two days in the middle of last week when freakish conditions prevailed, have stimulated demand and consumption of gasoline. There have been no tangible changes in the motor-fuel market as a result of improved driving conditions, but the resistance to downward pressure is much more substantial than in the recent past weeks. A tendency to resist current and future market depressants was apparent in the tankcar market, although tank-wagon and retail prices were adjusted downward in this area on February 10. There have been no further breaks in consumer tankcar, tank-wagon and retail markets of more than local character since the adjustment of February 10, and many in the trade feel that opening of the California fair, the approaching opening date of the New York World's Fair and more favorable driving conditions will provide sufficient impetus to hold at least present levels and possibly start an upward movement in the reasonably near future.

The most formidable obstacle to an early season upswing in the motor-fuel market is the rate at which crude has been run to stills during the past few weeks and the rapid climb of motor-fuel stocks resulting therefrom. Another factor of probably less significance, but one to be considered, nevertheless, is the weakness existing in the tanker-charter structure applicable to transportation from the Gulf Coast to the larger terminals in the East. Several weeks of brisk activity will be required to take up the slack currently existing in the boat-charter market. Chartering for March loading was practically at a standstill last week, and tanker owners are reported more nervous over the rate structure for the early part of the summer.

Commitments for the early summer months have been delayed, it is believed in the trade, because of uncertainty over several related factors. One cause for delaying immediate purchase of April and May requirements is the uncertainty over the Connally "hot oil" law now pending reenactment or defeat in Washington. There is not much doubt that the Connally law prohibiting interstate movement of petroleum and products in excess of state regulatory allowables will be reenacted. However, purchasers of sizable supplies are not overlooking the market effect of the outside chance of defeat. Then, too, there is the possibility that tanker rates may skid even lower than the present level, which would give a slight additional market advantage.

The crude-oil production picture is not entirely clear cut, and in its current sensitive state, slight influence may produce an impact throughout the petroleum-market structure. Unless drastic corrective steps are taken in the operating rate by the nation's refiners, it seems inevitable that motor-fuel stocks will materially exceed 82,000,000 bbls. on April 1, which was the economic goal set up at the beginning of the year. In fact, at the current rate of increase, which has averaged in recent weeks about 1,800,000 bbls. weekly, the total on April 1 may not be much, if any, lower than that of 92,300,000 bbls. on the same date in 1938.

With exception of Wednesday and Thursday last week, the temperature along the northern seaboard could be classified as mild for the season. On the first of the two-day exceptions, temperatures tumbled 49° in about 18 hours and sent the mercury down to 15° in New York and lower in the New England and northern New York State districts. Aside from the temporary bulge in fuel-oil requirements during the brief and bitter cold snap, demand and prices for burning products have been slowly but steadily declining.

Some suppliers are offering No. 2 fuel oil to the New York tankcar trade at 3⅞ cents per gallon. Deliveries in barges can be had at 3¾ cents and possibly at 3⅝ cents in certain directions. Most of the major suppliers are still quoting 4 cents per gallon to the tankcar trade, although material at the lower figures is said to be reasonably abundant. Kerosene has suffered along with its companion grade of light burning oil and most sellers around New York are willing to make deliveries at 4⅞ cents in tankcars and 4¾ cents per gallon in barges. The one area of resistance to lower prices for light burning oil is centered around Boston and Providence, although the two points have been considered below normal for several weeks, which may account for the upward adjustment last week. Socony-Vacuum Oil Co., Inc., elevated No. 2 fuel-oil prices in tankcars at Boston an eighth of a cent per gallon to 4 cents, and a corresponding advance to the present level was instituted at Providence.

Kerosene for domestic coastwise movement was offered an eighth of a cent lower at several Gulf Coast refineries last week. A majority of sellers there offered bulk shipments at 3¾ to 4 cents per gallon, compared to 3⅞ and 4⅛ cents prevailing in the first week of February. It is indicated that most of the seasonal purchasing of kerosene is over and future demand from the primary markets will be in the nature of meeting normal summer commercial requirements.

Competitive conditions in the tank-wagon fuel-oil market around New York are reaching the customary intensity expected near the close of the heavy consuming season. Despite a reduction of one-half to three-quarters of a cent per gallon February 10 and 11 by leading eastern suppliers, the price concessions direct to consumers continue uninterrupted. Tank-wagon deliveries are being made in Brooklyn of No. 2 fuel oil at 5½ cents per gallon and lower if prospective customers insist upon bargains. In other parts of the metropolitan New York market the tank-wagon market remains around 5⅞ to 6 cents per gallon, but in most instances the greater margin between tankcar and tank-wagon prices is being passed on to the consumer.

Motor-fuel prices in New York remained fairly steady. Some suppliers are quoting minimum of 5¾ cents per gallon for 65-octane material, while others are asking 6 cents. Reports from some quarters that 65-octane gasoline was being offered at 5⅝ cents in tankcars could not be confirmed. Some movement was reported at 5⅝ cents to barge customers, but in general the downward movement appears to be halted. Gulf Coast refiners supplying the coastwise trade were reasonably firm in their quotations, ranging from 4¼ cents minimum for 59-octane motor fuel to a maximum of 5⅛ cents per gallon for 70-octane material.

In the export market, however, Gulf Coast suppliers moved to meet the competition from California suppliers by dropping their quotations on the lower octane grades an eighth of a cent per gallon. Several suppliers were quoting 4¼ cents per gallon for 60-, 61-, and 62-octane motor fuel to French and British potential customers. Movement of a cargo of 80,000 bbls. of California gasoline to Le Havre, France, jolted Gulf Coast refiners into more active quest of Continental European business at a price.

(Continued on Next Page)

A. P. I. Weekly Refinery Statistics

Week Ending February 18, 1939

	Capacity reporting (per cent)	Daily crude runs (bbls.)	Total gasoline stocks	Gas oil and fuel oil stocks
East Coast	100.0	502,000	19,982,000	9,076,000
Appalachian	85.9	107,000	3,326,000	751,000
Indiana, Illinois, and Kentucky	89.5	448,000	14,293,000	5,965,000
Oklahoma, Kansas, and Missouri	81.6	250,000	7,668,000	4,228,000
Inland Texas	50.3	129,000	1,938,000	1,912,000
Texas Gulf	89.5	706,000	10,615,000	8,017,000
Louisiana Gulf	97.3	119,000	2,616,000	1,493,000
North Louisiana and Arkansas	55.0	41,000	495,000	856,000
Rocky Mountains	54.2	45,000	1,696,000	664,000
California	90.0	422,000	15,336,000	98,994,000
Total reported	85.8	2,769,000	77,965,000	131,956,000
Estimated unreported	.....	356,000	5,110,000	3,140,000
*Estimated total	.....	3,125,000	83,075,000	135,096,000
*Estimated total previous week	.....	3,130,000	80,950,000	137,241,000
*February 19, 1938	.....	3,149,000	89,992,000	120,940,000

*Bureau of Mines, currently estimated.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATES)

Week ending February 11, 1939	271,553,000 barrels
Week ending February 4, 1939	272,214,000 barrels
Week ending February 12, 1938	304,915,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

Retail Oil Markets

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of February 21, 1939

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank-wag.	Gasoline Dlr.	Gasoline Inc. tax	Kero. tank-wag.
Chicago, Ill.	15.1	12.1	4.0	10.0
Decatur	15.1	12.6	4.0	10.0
Joliet	15.1	12.6	4.0	10.0
Peoria	15.1	13.1	4.0	10.0
Quincy	14.9	12.9	4.0	8.7
Davenport, Ia.	15.1	13.6	4.0	‡10.0
Des Moines	14.9	13.4	4.0	‡9.8
Mason City	15.3	13.8	4.0	‡10.2
Duluth, Minn.	16.9	15.4	5.0	10.8
Mankato	16.5	15.0	5.0	8.9
Minneapolis	16.0	14.5	5.0	10.4
LaCrosse, Wis.	16.5	15.0	5.0	10.4
Green Bay	16.9	15.0	5.0	10.3
Milwaukee	14.9	13.4	5.0	10.2
Detroit, Mich.	13.1	11.6	4.0	7.1
Grand Rapids	14.0	12.5	4.0	9.7
Saginaw	15.8	14.3	4.0	9.3
Evansville, Ind.	16.6	15.1	5.0	†10.5
Indianapolis	16.8	15.3	5.0	†10.0
South Bend	17.1	15.6	5.0	†9.0
Fargo, N. Dak.	16.7	15.2	4.0	11.6
Minot	18.0	16.5	4.0	12.9
Huron, S. Dak.	17.0	15.5	5.0	10.9
Kans. City, Mo.*	14.4	11.9	4.0	7.5
St. Louis*	14.2	12.7	4.0	8.0
St. Joseph	14.4	11.2	4.0	9.3
Wichita, Kans.	13.9	10.6	4.0	7.3

*State tax 2 cents, 1-cent city tax and 1-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gallons or more, 1.5 cents off; minimum delivery 25 gallons.

Stanolex Fuel Oil in Chicago

Effective February 15, 1939, f.o.b. Chicago tank-wagon prices: Standard range oil, 1-99 gallons, 9 cents; 100-149 gallons, 8 cents; 150 gallons and over, 7.5 cents. Stanolex fuel oil No. 1, 1-149 gallons, 8.25 cents; 150-399 gallons, 7.25 cents; 400 gallons and over, 6.75 cents. Stanolex furnace oil, 1-149 gallons, 8.25 cents; 150-399 gallons, 7.25 cents; 400 gallons and over, 6.75 cents. Stanolex Grade A, 1-399 gallons, 5 cents; 400 gallons and over, 4 cents. Stanolex Grade B, 1-799 gallons, 4.75 cents; 800 gallons and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Tank-wag. con'r.	Gasoline Divided dlr.	Gasoline Inc. tax	Kero. tank-wag.
Ohio points	16.0	15.0	5.0	*13.0

*Includes state tax of 1 cent.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r. tank-wag.	Gasoline Net dlr.	Gasoline Inc. tax	Kero. tank-wag.
Atlanta, Ga.	18.5	15.5	7.0	8.5
Augusta	19.5	16.5	7.0	9.0
Macon	18.0	15.0	7.0	10.0
Savannah	17.5	14.5	7.0	8.0
Birmingham, Ala.	20.0	17.0	8.0	8.5
Mobile	21.0	18.0	9.0	8.5
Montgomery	21.0	19.0	9.0	10.5
Jackson, Miss.	17.5	14.5	7.0	9.5
Vicksburg	19.0	16.0	7.0	9.0
Jacksonville, Fla.	20.0	17.0	8.0	8.0
Miami	18.5	15.5	8.0	8.0
Pensacola	21.0	18.0	9.0	8.0
Tampa	19.0	16.0	8.0	8.0
Lexington, Ky.	19.0	16.0	6.0	10.0
Covington	17.5	14.5	6.0	9.5
Louisville	17.5	14.5	6.0	9.0
Paducah	18.5	15.5	6.0	9.0

Price basis to tank-wagon consumers: Effective January 4, 1937; 3 cents per gallon below tank-wagon price. Effective June 4, 1938, 2 cents per gallon discount eliminated from all kerosene markets in Mississippi, Alabama, Georgia, and Florida, markets being reduced correspondingly to a net basis.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
Atl'tic City, N. J.	10.9	12.7	4.0	8.0
Newark	10.9	12.7	4.0	8.0
Annapolis, Md.	12.85	14.35	5.0	9.5
Baltimore	12.25	13.75	5.0	8.5
Cumberland	13.65	16.15	5.0	10.0
Wash'gton, D. C.	10.50	12.0	3.0	9.5
Danville, Va.	14.45	16.95	6.0	12.9
Norfolk	13.25	15.75	6.0	11.5
Petersburg	13.55	16.05	6.0	11.7
Richmond	13.55	16.05	6.0	8.7
Roanoke	14.75	17.25	6.0	11.0
Charles'n, W. Va.	14.05	16.55	6.0	12.6
Parkersburg	13.35	14.85	6.0	11.2
Wheeling	14.35	15.75	6.0	12.2
Charlotte, N. C.	15.65	18.15	7.0	12.1
Hickory	16.15	18.65	7.0	12.5
Mt. Airy	15.95	18.45	7.0	12.3
Raleigh	15.25	17.75	7.0	11.6
Salisbury	15.75	18.25	7.0	12.2
Charleston, S. C.	14.25	16.75	7.0	10.6
Columbia	15.25	17.75	7.0	11.6
Spartanburg	15.95	18.45	7.0	12.4

Price basis to Essolene undivided dealers: Dealer tank-wagon price less .5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gallons, consumer tank-wagon price at time and place of delivery; 100,000 gallons per year, consumer tankcar price plus .5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less .5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gallons or more, consumer tank-wagon price. Single deliveries of less than 50 gallons, 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less .5 cent per gallon. The above policy also applies in South Carolina effective January 23, 1939.

Discounts for kerosene, 1 cent off tank-wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except no discount in New Jersey.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank-wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank-wag.
San Francisco	17.5	18.5	4.0	11.5
Los Angeles	17.0	18.0	4.0	10.0
Fresno, Calif.	18.5	19.5	4.0	12.5
Phoenix, Ariz.	21.5	22.5	6.0	*17.5
Reno, Nev.	20.5	21.5	5.0	13.5
Portland, Ore.	20.0	21.0	6.0	13.5
Seattle, Wash.	20.0	21.0	6.0	13.5
Spokane	23.0	24.0	6.0	16.5
Tacoma	20.0	21.0	6.0	13.5

*Includes 5-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents; to split dealers, 2 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gallons and over, advance quantity discount extended at time of delivery, 3 cents. Service station schedule applies on single deliveries less than 40 gallons. On kerosene in tankcar, transport truck and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank-wagon.

Pennsylvania, Delaware, and Part of New England

ATLANTIC REFINING CO.

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
Philadelphia, Pa.	12.0	13.0	5.0	10.0
Pittsburgh	13.0	15.0	5.0	10.5
Allentown	12.75	14.25	5.0	10.5
Erie	13.0	14.5	5.0	10.0
Scranton	13.0	14.5	5.0	10.5
Altoona	13.0	15.0	5.0	10.5
Dover, Del.	...	13.5	5.0	10.5
Wilmington	...	12.5	5.0	9.75

Price basis to undivided dealers, dealer tank-wagon price less .5 cent per gallon. Price basis to commercial consumers in Pennsylvania and Delaware, effective March 11, 1937: Consumers under contract using 100,000 gallons or more per year full compartment hose deliveries, tankcar plus .5 cent. Consumers under contract using less than 100,000 gallons per year compartment hose deliveries, undivided dealer price. Consumers under contract less than full compartment delivery, consumers not under contract, less than full compartment delivery, and consumers not under contract full compartment delivery, divided dealer price. Less than 25 gallons, tank-wagon delivery, 4 cents per gallon above undivided dealer price.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
Albany	11.5	13.8	5.0	8.0
*Met. N. Y.:				
Manhat., Bronx	11.5	12.9	5.0	8.0
Staten Island	11.5	12.9	5.0	8.0
Queens, Br'klyn	11.5	12.9	5.0	8.0
Buffalo	12.0	12.5	5.0	7.5
Rochester	12.5	13.5	5.0	7.5
Syracuse	12.0	13.5	5.0	8.5
Boston, Mass.	10.25	12.3	4.0	7.0
Portland, Me.	11.5	13.5	5.0	7.5
Manchester, N. H.	12.1	14.1	5.0	8.0
Burlington, Vt.	12.0	14.2	5.0	9.0
Springfield, Mass.	10.75	12.8	4.0	7.5
Worcester	10.75	12.8	4.0	7.5
Hartford, Conn.	10.75	12.8	4.0	6.5
New Haven	10.75	11.5	4.0	6.0
Providence, R. I.	10.25	12.3	4.0	7.0

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Price basis to undivided dealer: Posted dealer tank-wagon price less .5 cent. Price basis to commercial consumer: Effective Nov. 15, 1936, monthly purchases of 25,000 gallons and over, consumer tankcar prices at delivery point plus .5 cent per gallon; monthly purchases of 5,000 to 25,000 gallons, undivided dealer price at delivery point; monthly purchases under 5,000 gallons, pay divided dealer tank-wagon prices at delivery point.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Dealer	Gasoline Inc. tax	Kero. tank-wag.
Denver, Colo.	15.5	5.0	11.5
Grand Junction	16.0	5.0	15.0
Pueblo	13.0	5.0	10.5
Casper, Wyo.	17.0	5.0	11.5
Cheyenne	15.0	5.0	13.0
Billings, Mont.	18.0	6.0	13.0
Butte	19.5	6.0	15.5
Great Falls	18.0	6.0	15.5
Helena	19.0	6.0	15.5
Salt Lake City, Utah	16.0	5.0	16.0
Boise, Idaho	19.0	6.0	18.0
Twin Falls	19.5	6.0	18.0
Albuquerque, N. M.	16.0	*6.5	10.0

*Includes city tax of .5 cent.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank-wag.	Gasoline Dlr.	Gasoline Inc. tax	Kero. tank-wag.
Omaha	17.5	14.5	6.0	10.3
McCook	17.5	15.5	6.0	10.0
Norfolk	17.9	14.9	6.0	10.7
North Platte	18.3	15.4	6.0	11.0
Scottsbluff	17.0	14.9	6.0	11.2

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
New Orleans, La.	16.75	19.25	*10.0	†11.0
Baton Rouge	14.75	17.25	8.0	‡10.5
Alexandria	14.75	17.25	8.0	‡12.5
Lafayette	15.00	17.50	8.0	‡12.5
Lake Charles	14.75	17.25	8.0	‡12.5
Shreveport	13.50	16.00	8.0	‡11.0
Knoxville, Tenn.	18.00	20.50	8.0	14.5
Memphis	16.00	18.50	8.0	12.5
Chattanooga	17.50	20.00	8.0	14.0
Nashville	17.00	19.50	8.0	12.0
Bristol	18.25	15.25	8.0	14.5

Essolene at dealer price less .5 cent per gallon to undivided dealers.

*Includes 2-cent parish tax. †Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gallons or more in one delivery take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less .5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gallons, consumer tankcar plus 2 cents per gallon; 50 to 199 gallons, consumer tankcar plus 1 cent per gallon; 200 gallons and over, consumer tankcar plus .5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Dealer	Gasoline Inc. tax	Kero. tank-wag.
Texarkana, Ark.	12.0	5.0	8.0
Fort Smith	13.25	5.0	7.5
Little Rock	16.75	7.5	9.0
Muskogee, Okla.	13.0	5.0	7.0
Oklahoma City	10.5	5.0	6.0
Tulsa	10.0	5.0	6.0

Texas

	Gasoline Tank-wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank-wag.
Dallas, Tex.	11.0	15.0	5.0	7.0
Fort Worth	11.0	15.0	5.0	8.0
Houston	13.0	17.0	5.0	8.0
San Antonio	14.0	18.0	5.0	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank-wagon*
Oleum spirits	15.7
V.M.&P. naphtha	16.0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax but not 1-cent federal tax or 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gallon lots if covered by contract.

Canada*

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Tank-wag.	Inc. tax	Kero. tank-wag.
Halifax, N. S.	23.5	10.0	17.5
St. John, N. B.	23.5	10.0	17.5
Montreal, Que.	20.0	6.0	14.5
Toronto, Ont.	21.0	6.0	15.5
Hamilton, Ont.	21.0	6.0	15.5
Winnipeg, Man.	27.5	7.0	20.7
Brandon, Man.	28.1	7.0	22.0
Regina, Sask.	26.0	7.0	22.0
Saskatoon, Sask.	28.3	7.0	24.9
Edmonton, Alta.	26.5	7.0	21.5
Calgary, Alta.	23.5	7.0	19.0
Vancouver, B. C.	23.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In maritime provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. of Louisiana February 9 reduced dealer tank-wagon gasoline 1.75 cents in Bristol.

Standard Oil Co. of New Jersey February 13 advanced dealer tank-wagon gasoline .5 cent in Columbia.

Standard Oil Co. (Kentucky) February 7 reduced consumer tank-wagon and net dealer gasoline 1 cent in Miami; February 13, reduced consumer tank-wagon and net dealer gasoline 1.5 cent in Savannah. February 11, reduced tank-wagon kerosene 1 cent in Augusta.

New York Market

(Continued from Preceding Page)

The upward push of bright-stock prices in the western Pennsylvania refinery district broke through the crust of resistance last week and resulted in a general elevation of 1 cent per gallon on the 25-pour test grade. Most suppliers are now quoting 15 cents per gallon on 25-pour test and one or two are asking 16 cents. Other grades of Pennsylvania lubricating oils are steady with cylinder stocks bumping against the present market ceiling. Recent gains in wax prices have been consolidated and appear firmly situated at a range of 2.45 to 2.55 cents for crude-scale grades.

Prices of Refined Products

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of February 21, 1939

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 octane and below	.03½	.03⅝
63-66 octane	.04	.04⅛
67-69 octane	.04⅛	.04⅜
70-72 octane (regular)	.04½	.04⅝
60-62 400 grades:		
62 octane and below	.03½	.03⅝
63-66 octane	.04	.04⅛
67-69 octane	.04⅛	.04⅜
70-72 octane (regular)	.04½	.04⅝
64-66 375	.04	.04¼
68-70 360	.05	.05¼

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.03½	.03⅝
63-66 octane	.04	.04⅛
67-69 octane	.04⅛	.04⅜
70-72 octane (regular)	.04½	.04⅝
60-62 400	.03½	.03⅝
64-66 375	.04	.04¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
62 octane and below	.04	.04¼
63-66 octane	.04¼	.04½
67-69 octane	.04½	.04¾
70-72 octane (regular)	.04⅞	.05⅛

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
62 octane and below		.04
67-69 octane	.05	.05⅛

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.03⅝	.03¾
63-66 octane	.03⅞	.04⅛
67-69 octane	.04⅛	.04⅜
70-72 octane	.04⅜	.04⅝
60-62 400 grades:		
62 octane and below	.03⅝	.03¾
63-66 octane	.03⅞	.04⅛
67-69 octane	.04⅛	.04⅜
70-72 octane	.04⅜	.04⅝
64-66 375	.04	.04¼
68-70 360	.05	.05¼

PENNSYLVANIA (inland refineries)—

58-60 U. S. Motor:		
Below 60 octane	.04¼	.04¾
65 octane		.06¼
68-70 octane		.06½

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.06½	.08
58-60 400, 65 oct. and higher	.07½	.09

EAST COAST (domestic)—

U. S. Motor, 65 and above:		
*New York (Bayonne)	.06	.06¼
Philadelphia	.06	.06¼
Baltimore	.06	.06¼
Charleston, S. C.	.06½	.06¾

*All grades of gasoline one-eighth to one-fourth cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery one-fourth cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane		.04¼
60-64.9	.04½	.04⅝
65 octane and higher		.04⅝
68-70	.04⅞	.05⅛

Naphtha

PENNSYLVANIA (inland refineries)—

52-56 450 (blending)	.04¼	.04½

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02½
Grade 18-55		.03

NORTH TEXAS—

Grade 26-70	.02⅝	.02½
Grade 18-55	.02¾	.02⅞

CALIFORNIA—

75-85 375-390	.06½	.07

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.02¾

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p.	.03¾	.03⅞
41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p.	.04	.04¼
46-48 gr., 210-230 i.b.p., 480-max., e.p.	.04⅜	.04⅝

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.03⅞	.04
42-44	.04⅛	.04¼

NORTH TEXAS—

41-43	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04	.04⅜

ARKANSAS (Ark. and N. La. del.)—

41-43		.04⅛

PENNSYLVANIA (inland refineries)—

45	.04⅝	.04⅞
46	.04¾	.05
47	.04⅞	.05⅛

CHICAGO (Based on Group 3)—

41-43	.03⅞	.04⅛
42-44	.04⅛	.04⅜

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04¾	.05¾

NEW YORK (Bayonne, N. J.)—

41-43	.04⅝	.04⅞

***GULF COAST (domestic)—**

41-43	.03⅞	.04⅛

*Barge price one-eighth cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03⅝	.03¾
No. 1 prime white, 38-42	.03½	.03⅝
No. 1 straw, 38-40	.03⅜	.03½
No. 2 straw, 32-36	.03¼	.03⅜
No. 2 dark, 32-36	.03⅛	.03¼
No. 3 zero to 15, 28-32	.03	.03⅛
No. 3, 15 and above, 28-32	.02¾	.02⅞

NORTH TEXAS—

No. 1 prime white, 38-42	.03½	.03⅝
No. 1 straw, 38-40	.03⅜	.03½

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03⅜	.03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36		.03⅝

CHICAGO (Based on Group 3)—

Range oil	.03⅝	.03¾
No. 1 prime white, 38-40	.03½	.03⅝
No. 1 straw, 38-40	.03⅜	.03½
No. 2 straw, 32-36	.03¼	.03⅜
No. 2 dark, 32-36	.03⅛	.03¼
No. 3, zero to 15, 28-32	.03	.03⅛
No. 3 15 and above, 28-32	.02¾	.02⅞

NEW YORK (Bayonne, N. J.)—

*No. 1	.04½	.04⅝
*No. 2		.04
*No. 4		.04

*Barge deliveries one-eighth to one-fourth cent under above tankcar price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil	.02⅞	.03⅛
No. 4, low pourpoint, 24-28	1.00	1.10
No. 4, 15 and above, 24-28	.85	.90
No. 5, low pourpoint, 18-22	.70	.75
Below 14 fuel oil, industrial	.50	.60

NORTH TEXAS—

U.G.I. gas oil	.02⅞	.03⅛
No. 4, low pourpoint, 24-28	.100	1.10
No. 5, low pourpoint, 18-22	.70	.75
Below 14 fuel oil, industrial	.50	.60

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.70	.75

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02¾	.02⅞
No. 4, low pourpoint, 24-28	1.00	1.10
No. 4, 15 and above, 24-28	.85	.95
No. 5, low pourpoint, 18-22	.70	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pourpoint, 10-16	.60	.70
No. 6, 15 and above, 10-16	.35	.45

PENNSYLVANIA (inland refineries)—

36-40	.03¾	.04⅛

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.15	1.35
24 plus Diesel, per bbl.	1.00	1.30
24 plus Diesel (bunkers)	1.15	1.50
12-16 (bunkers at tidewater)	.75	.90
10-16 (cargo lots)	.60	.80
12-17 (tankcars)	.50	.80
10-17 (high sulfur)	.45	.70
San Joaquin Valley:		
10-18 (tankcars)	.50	.80
24 plus Diesel, per bbl.	1.15	1.40
San Francisco:		
24 plus Diesel, per bbl.	1.40	1.45
24 plus Diesel (bunkers)	1.45	1.55
10-16 (bunkers)	.90	.95

GULF COAST—

No. 2 fuel	.03⅜	.03⅝
43-47 Diesel	.03½	.03⅝
48-52 Diesel	.03½	.03⅝
53-57 Diesel	.03⅝	.03¾
Bunker C (bulk cargoes)	.67½	.70
Bunker C (bunkers)		.75

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04
28-30 Diesel (lighterage 6¼c per bbl.)		1.65
28-30 Diesel (tankcars)	.04¼	.04½
Bunker C (to ocean-going ships in N. Y. Harbor)		.95
Industrial fuel (tankcars)		.03¼

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

190-200 D, 15-25		.19
150-160 D, 0-10	.14¼	.16
150-160 D, 15-25	.13½	.15½
150-160 E, 15-25	.13	.15
100-110 D, 0-10		.14½
Steam refined:		
631 green (treated)		.12½
600 dark green (untreated)	.04½	.05

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pourpoint	.17	.17½
15 pourpoint	.16	.16½
20 pourpoint	.15	.15½
25 pourpoint	.14½	.15½
Steam refined:		
600	.08	.08½
650	.10	.10½
600 Pennsylvania flash	.10½	.11
630 flash	.13½	.14
600 Warren E filtered	.12½	.13

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

150-3		.09
180-3		.10
180-4		.09½
200-3		.10½
200-4		.10
250-3		.11½
250-4		.11
280-3		.12½
280-4		.12
300-6½		.13
400-3½		.14
100-2½ paraffin oil		.06
15-20 pourpoint:		
200-3		.10
200-4		.09½
250-3		.11
250-4		.10½
280-3		.12
280-4		.12½

GULF COAST—

Pale oils:		
200-3	.07	.07¼
300-3	.07½	.07¾
500-3½	.08⅛	.08¾
750-3½	.08⅝	.09⅛
1,200-3½	.09½	.09¾
1,500-4	.09¾	.10
Red oils:		
200-5-6	.07¼	.07½
300-5-6	.07⅞	.07½
500-5-6	.08	.08½
750	.08¾	.09
1,200-5-6	.09¼	.09½

CALIFORNIA (moving to dom. market)—

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pourpoint	.16	.16½
10 pourpoint	.15	.15½
15 pourpoint	.14	.14½
25 pourpoint	.13	.13½
200 vis. at 70° F., 3 color:		
Zero pourpoint	.18	.18½
10 pourpoint	.17	.17½
15 pourpoint	.16	.16½
25 pourpoint	.15	.15½

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (a.m.p.) w.c. scale	.0245	.0250

PENNSYLVANIA (inland refineries)—

122-124 (a.m.p.) w.c. scale	.0235	.0245
124-126 (a.m.p.) w.c. scale	.0235	.0245

NEW YORK—

Wax in bags fully refined:	
122-125 (a.m.p.) wax	.0350
125-127 (a.m.p.) wax	.0360
128-130 (a.m.p.) wax	.0375
130-132 (a.m.p.) wax	.0435
133-135 (a.m.p.) wax	.0465
135-137 (a.m.p.) wax	.0490
124-126 (a.m.p.) w.s.	.0245
124-126 (a.m.p.) y.s.	.0240

Petrolatum in barrels, carload lots:

Dark green	.02	.02⅛
Amber	.02⅜	.02½
Extra amber	.02⅝	.02¾
Lily white	.05⅛	.05¼
Snow white	.06⅛	.06¼
Cream	.04⅛	.04¼

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.04¼	.04⅜
60-62 400	.04¼	.04⅜
61-63 390	.04⅜	.04⅝
64-66 375	.04½	.04⅝

LOS ANGELES—

U. S. Motor grades:		
55-65 octane	.04½	.04¾
65-69 octane	.04¾	.05
Above 69 octane	.05	.05½

KEROSENE

GULF COAST—

41-43 prime white	.03⅞	.04⅛
41-43 water white	.03⅞	.04⅛

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbls.)—

Cylinder stocks:		
600 Warren E	.15	.15½
600 S.R. unfiltered	.16	.16½
630 S.R. unfiltered	.17	.17½
600 flash, S.R.	.17	.17½
630 flash, S.R.	.20½	.21
Bright stocks:		
8 color	.16¾	.16½

NEUTRAL OIL

200-3 color	.21½	.22
150-3 color	.19½	.20

PARAFFIN WAX

NEW YORK (prices per pound)—

123-125 a.m.p.		.0375
125-127 a.m.p.		.0387
128-130 a.m.p.		.0412
133-135 a.m.p.		.0437
135-137 a.m.p.		.0455
Crude scale:		
124-126 w.s.	.0245	.0250
124-126 y.s.	.0245	.0250

WIESS

(Continued from Page 46)

work out an effective solution. I submit that as a practical matter, a satisfactory solution would be effected by a consistent program of fair allocation of allowables between properties and of providing and enforcing regulations for uniform and wide spacing of wells.

The practical defense the individual producer has is to drill fewer wells in order to recover his reserve; to get more barrels of oil from the ground for each well drilled. Why pile up investments in wells in the face of steadily declining well allowables? Why drill two wells when one will get the oil? Is not the surest answer to heavy expenditures and decreasing allowables, to space wells wider, to drill one well to 20 acres where before we drilled a well to 10 acres, and even to increase the spacing to 40 and 80 acres per well? This is an individual problem as well as an industry problem, and one in conservation administration. Each operator has a part to play by adopting a policy of wide spacing and by assisting in bringing about the adoption and application of rules that will withdraw the incentive for excessive drilling.

These conditions growing out of unnecessary drilling are seriously in need of immediate correction. However, they do not account entirely for the trouble confronting the industry at present. With the proration system today, under which effort is being made to limit the storage of crude and products to that amount required as working stocks, and to hold unneeded oil in natural reservoirs, and under which the industry and the conservation agencies are keenly observant of changes in stocks of oil, any sudden supply of oil from new sources injected into the stream going to market displaces production from sources already held under substantial restraint. The industry was able to absorb in its stride flush production in quantity from such fields as Rodessa during the period of phenomenal demand from 1935 to 1937. However, it cannot stand such shocks today. The forcing into the market of production from new areas of importance at this time causes serious disturbances. One result is to decrease purchases by established buyers in existing fields, sometimes at great distance from the new area. This transmits immediately the difficulties in new areas to distant established fields previously enjoying stable conditions.

During the year 1938 the industry in established producing areas was forced to bear the burden of increased production from important areas at the same time that total national demand for crude diminished. The average daily production for the United States in December 1938 was 230,000 bbls. per day less than the average for the year 1937. The daily average production for the states of Louisiana, Illinois, and Arkansas for the same month in 1938 was 123,000 bbls. per day greater than the daily average production of these three states during the banner year of 1937. In other words, it was necessary for other oil-producing states to reduce production by 353,000 bbls. per day to take care of the decline in national production and compensate for the substantial increase in participation by the three states mentioned.

Having in mind the problems of control brought on by the drilling of excessive wells, the magnitude of the additional difficulties presented by forcing into the market production from these new areas is apparent. A substantial part of the increased production referred to is going to market at a discount. Furthermore, competent engineers estimate that many of the fields in these states are being produced at excessive rates, resulting in waste and lower ultimate recovery. Thus advantage is not being taken of the progress and experience of the past 15 years. Given time, economic forces would correct the situation from a stabilization standpoint, but at great cost. The physical waste occurring in the meantime could never be remedied. It seems that a logical solution would be found by the acceptance in practice of established principles of efficient operation such as I have described. By taking hold of the situation promptly, it can be corrected. The opportunity is open to profit by the earlier painful experiences of others and to avoid sacrifices not only by the particular areas involved, but by the industry in general.

Augmented Reserves

During the last 10 years the discovery of new fields and the proving up of larger deposits than previous estimates had indicated for older fields augmented our proved reserves in the United States approximately 15,000,000,000 bbls. During the same period production amounted to approximately 10,000,000,000 bbls., resulting in net additions to reserves of approximately 5,000,000,000 bbls. Of this amount, approximately 4,000,000,000 bbls. are accounted for by the East Texas field.

The production for the five-year period beginning with 1929 averaged 900,000,000 bbls. per year. We estimate the average annual production over the next five years at approximately 1,350,000,000 bbls. This is an increase of approximately 50 per cent. It all indicates that, unless the rate of discovery is accelerated, we may expect slight, if any, additions to reserves during the next five-year period, and a likelihood of a decrease in reserves expressed in terms of years' supply. It would appear, therefore, that the difficulty lies not in the presence of proved reserves, but in the undue rate at which some of the existing reserves are being depleted. While in some states reserves are being depleted at a rate indicating 18 to 20 years' supply, some other states are producing at rates allowing for only about six years' supply. It is this rapid rate of depletion in some areas of the country that gives rise to the immediate problem of overproduction and consequent waste.

In certain respects the problem of potential overproduction which we face today is different from the overproduction of the past. Heretofore the problem has been confined either to specific fields or limited areas, and was not general or distributed over several states as it is today. We have not had a great deal of experience in working out or applying sound principles for distribution of the total market outlet between the states, although considerable groundwork has been laid during the last three years by the Interstate Compact Commission. In this problem, as in that of allocating the total production of any state between fields, the principle of waste prevention should play a large part and the distribution should not depend entirely on localized market demand.

Large allowables should not be assigned under the guise of localized market demand when, as a matter of fact, the market is obtained only at a serious sacrifice of price or by loss of markets elsewhere. When new production forces its way into the markets by such means it actually indicates the absence of real market demand. When abundant new supplies of oil are found and a place for them in the market is insisted upon, the determination of the proper size of such new area's participation in the market should necessarily involve consideration of the total reserve of oil available in the new area compared to the reserve in established areas. This is necessary to the prevention of physical waste and the attainment of maximum oil recovery. I realize the difficulty of using reserves as a strict measuring stick for participation of any area in the total market demand. However, a broad relationship does exist between the amount of reserves and the rate of production without waste. This lends force to those who advocate the use of comparative reserves as one of the factors in determining state participation in the total national demand.

In the light of the principles which I have outlined and the analysis of present-day conditions, and out of my observation, study and experience, I would like to submit for consideration, analysis and application the following broad policies:

1. Our oil reserves should be developed and produced with maximum practical efficiency both from physical and economic viewpoints.

2. To attain such maximum efficiency it is essential that the total production of the United States be restricted to market demand requirements.

3. To attain such maximum of efficiency, localized market demand should not be the sole criterion by which to restrict local production.

4. Each state and each area or field within each state should produce in such a manner as to coordinate the requirements of market demand and physical efficiency. This would be furthered by accepting the principle that each state participate in supplying the total market requirements largely on the basis of reserves, with appropriate prior recognition to stripper production.

5. Remove the incentive for unnecessary and unprofitable drilling. Subject to the requirements of minimum physical waste, this calls for the acceptance as an incident of proration of the general principle that each operator seek to produce only the recoverable oil from his land.

I believe that adherence to the policies above outlined will go a long way toward removing the

U. S. BUREAU OF MINES ESTIMATES OF DEMAND—PARTICIPATION IN PRODUCTION—RESERVES BY STATES IN THE UNITED STATES

Showing particularly by states for December 1938 comparison between actual participation in the total United States production and calculated participations assuming that the distribution be based upon prior recognition of stripper production with the remainder participated in according to various combinations of relative localized market demand and relative flush crude-oil reserve.

State—	December 1938 — U.S.B.M. est. demand		December 1938 — Actual production, bbls. daily				Estimated reserve* (billion bbls.) January 1, 1939			
	Bbls. daily	% of U.S.	Flush	Stripper	Total	% of U.S.	Flush	Stripper	Total	% of U.S.
Texas	1,343,900	40.7	1,150,000	150,000	1,300,000	39.7	8.950	0.550	9.500	54.2
New Mexico	100,300	3.0	88,000	10,000	98,000	3.0	0.617	0.033	0.650	3.7
Louisiana	248,000	7.5	233,000	26,000	259,000	7.9	0.898	0.052	0.950	5.4
Oklahoma	500,700	15.2	73,000	355,000	428,000	13.1	0.570	0.530	1.100	6.3
Kansas	159,000	4.8	98,000	54,000	152,000	4.6	0.571	0.124	0.695	4.0
Arkansas	51,600	1.6	22,000	28,000	50,000	1.5	0.133	0.052	0.185	1.1
Illinois	71,900	2.2	100,000	25,000	125,000	3.8	0.250	0.050	3.300	1.7
Michigan	51,000	1.5	23,000	28,000	51,000	1.6	0.022	0.028	0.050	0.3
Balance eastern states	97,100	2.9	.....	92,000	92,000	2.8	....	0.420	0.420	2.4
Balance Rocky Mountain	92,600	2.8	.....	69,000	69,000	2.1	....	0.405	0.405	2.3
California	589,700	17.8	453,000	198,000	651,000	19.9	2.755	0.495	3.250	18.6
Total United States	3,305,800	100.0	2,240,000	1,035,000	3,275,000	100.0	14.766	2.739	17.505	100.0

*Personal estimate.

difficulties in which the industry now finds itself. The principles and policies enumerated by me are not fundamentally new. They are recognized and accepted by many who deal with the problem. They were new 10 or 12 years ago. Their recognition today marks the progress made. While the problems and difficulties become complex with the addition of new units, new areas, and new states into the production picture, the problem is not so great as it was 10 years ago when the governing principles were unknown. The road to progress is not yet clear and wide, but the trail has been blazed. For the most part, the operators in all branches of the industry and the conservation authorities are trying to meet the issues in the right way. The complexities of the problem make it difficult to see the trail. The fact that the industry today is concerned with the problem is in itself a healthy sign and should lead to improvement. The attainment of the purposes desired requires that the industry and the individual operators face the issues frankly and squarely, examine their own methods, and seek to correct the situation by appropriate adjustment in policies and practices. It requires constructive remedial effort; not a destructive attitude involving criticism of the other fellow and the other unit and the attempt to place the blame for the situation on them. It requires the wholehearted cooperation of the industry at large, of the regulatory bodies of the several oil-producing states, and all others dealing directly with the oil problem. The ends sought justify the best efforts of all, and I am confident of continued progress.

INTERNATIONAL

(Continued from Page 55)

RUMANIA

Greater cooperation between the government and private oil companies, a reversal of the trend in recent former years, was probably the outstanding feature of 1938 petroleum activity in Rumania. The substantial increase in production from the Baicoi-Tintea field and the virtual certainty that this area will continue to expand in 1939 and possibly longer was the most important physical development of the year.

Production for all Rumania totaled 48,984,200 bbls. in 1938 compared to 53,239,500 bbls. in 1937, a decline of 4,255,300 bbls., or 8 per cent. Footage drilled during the past year totaled 961,000 feet compared to 1,278,000 feet in 1937, a drop of 25 per cent.

The increased output from the Baicoi-Tintea district and the gain of 2,518,700 bbls. in the output of the Ceptura district were the only important advances, but were insufficient to offset normal declines elsewhere. The greater declines occurred in the Bucsani, Boldesti and Moreni fields. Ceptura is expected to show a marked decline in production in 1939.

A further test on the north flank of the Manesti field resulted in salt water. Of three tests previously drilled to the Meotic sand in this same district, two were dry and one other was a salt water well. Tintea developed into a field of major importance in the Meotic sand. A unit operating agreement in this field, participated in by the government as royalty owner, contributed much to the orderly development, preservation of gas drive energy and to the future prospects for the area.

Most important of meager discoveries were at Draganeasa and a well is now testing at Magurele. Neither of the discoveries indicates pools of major proportions. The two minor discoveries were the only encouraging results of 10 wildcat tests attempted.

During 1938 there were 156 oil wells completed in proven fields of Rumania and 24 locations were active. There were five active wildcat tests listed when the year closed and during the year there were 10 wildcats abandoned, two having been carried over from 1937 for completion.

The high mortality of wildcat tests is due almost entirely to the current Rumanian mining laws which are likely to be revised in 1939 along lines of a draft now under consideration. The private companies are segregated into two classes so far as government attitude is concerned. Companies of foreign capital are discriminated against in favor of national concerns in the matter of land awards in exploratory areas. For the reason that they feel the rewards are insufficient in relation to the risks of exploratory drilling in Rumania the foreign companies have carried on only a compulsory amount of exploration confining their activities during the past two or more years as much as possible to the proven areas and moderate extension efforts.

PERU

By Oliver B. Hopkins
Chief Geologist
Imperial Oil Co., Ltd.

Peru produced 15,838,610 bbls. in 1938 or 1,618,406 bbls. below 1937, all from the LaBrea, Parinas, Lobitos, Restin, and Zarritos fields. The government continued testing reserved zones near Zarritos drilling on or completing six wells. One is a gas well at 2,619 feet and another was dry at 1,415 feet. The government made a geological study of the Pirin region north of Lake Titicaca. In eastern Peru, Cia. Petrolera El Ganzo Azul had showing of oil at 1,000 feet in a wildcat test.

There were 380,000 acres of new leases filed on near Contamana.

Fifty-four producers out of 65 completions were registered by International in LaBrea-Parinas field. Production there was 13,137,988 bbls., a decline of 1,584,766 bbls. The field has accumulative yield of 191,528,755 bbls. since 1890.

Lobitos produced about 2,660,622 bbls., a decline of 34,426. Total accumulative is 43,977,405 bbls. The company found a new shallow area east of El Alto, but potentials are small.

Zarritos produced 40,000 bbls.

IRAQ and EGYPT

By Ben B. Cox
Geologist
Socony-Vacuum Oil Co., Inc.

A slight increase in 1938 production from Iraq was reviewed by Mr. Cox, who gave a general sketch of the wildcat exploration program in parts of the Iraq Petroleum Co. concession east of the Tigris River.

The Egyptian exploration program is one of the most active in the Near East. Much of this new activity was the result of modification of the mining laws and a more liberal policy of the government in the matter of granting permits. Mr. Cox explained the division of permits into three classifications: exploration, exploitation, and mining leases. Prospects are Egypt will retain its present active position for an indefinite period. The new Ras Gharib field, Anglo-Egyptian Oilfields, Ltd., now contains three wells and others are being drilled as rapidly as the assigned equipment will permit.

GREAT BRITAIN

By A. H. Taitt
D'Arcy Exploration Co.

The test at Kingsclere, in Hampshire, was abandoned at 5,125 feet after entering Trias at 5,060 feet. A shallow test near Pevensey in Sussex encountered traces of oil in the Wealden series but was abandoned at 842 feet in the Kimeridge clay which underlies the Portland beds.

Seismic methods failed to confirm the structural picture obtained by previous gravity transverses, but confirmation of a structure near Ollerton in Nottinghamshire was obtained. A location was made. Eskdale No. 1 near Whitby in Yorkshire, was abandoned at 2,486 feet due to mechanical difficulty. Another nearby test has entered upper limestone of the Permian at 4,196 feet.

A test at Gun Hill in North Staffordshire to explore Lower Carboniferous was drilled. Lower Carboniferous limestone was entered at 1,535 feet. Cores of shale and lime breaks carried evidence of oil but limestone itself was barren. Deeper drilling was prosecuted for geological information. The Hardsoft well was deepened from 3,127 to 3,272 feet and acid treated. Production was increased from about 7 to 70 bbls.

The D'Arcy test at Cousland anticline near Edinburgh was completed at 2,917 feet for 10,000,000 cu. ft. of gas, with a small oil showing. A second well is drilling 200 feet structurally lower and a third was started 2 miles north of the first to prove the northerly extent of the structure. The Cousland anticline has two domes.

In Fifeshire, four shallow tests were drilled for structural information preparatory to making a decision to drill with a similar objective to that at Cousland. Shallow testing is under way on the Pentland fault which forms the western Carboniferous basin, on the eastern side of which is the D'Arcy-Cousland anticline.

Anglo-American Oil Co. completed No. 1 Midlothia, on the south dome of the D'Arcy-Cousland anticline in Scotland. It was drilled to 3,857 feet traversing the Lower Carboniferous and part of the Upper Devonian. It was plugged back to 1,760 feet and completed for a 10-bbl. per day oil well from 40 feet of sand in the oil shale group. A second well is drilling.

Gulf Exploration Co. (Great Britain) drilled a test at Penhurst in Kent to 5,600 feet. It traversed the normal series of Jurassic, Liassic, and Phaetic beds and then into lower Carboniferous limestone, without success and the test was abandoned.

The northeastern part of England offers best remaining prospects.

U.S.S.R.

By Basil B. Zavaico
Geologist
Chase National Bank

Production in U.S.S.R. in 1938 is estimated at 224,714,000 bbls., compared to 212,742,000 bbls. in 1937, an increase of 4.69 per cent, but 12.76 per cent below planned output. The Baku and Grozny districts were barely able to maintain their 1937 levels of production leaving responsibility for the gains in output on the Maikop and Ural districts.

Exploratory drilling in U.S.S.R. suffered acutely and the total work of this classification consummated did not equal more than 30 per cent of the plan. Expoitation drilling in or adjacent to proven and existing fields fulfilled the planned program by about 70 per cent.

The deepest well yet drilled in U.S.S.R. was completed in July 1938 in the pre-Kirmaku sands of the Old Measure at 10,640 feet. In an effort to surpass planned production in the Korski field in the Grozny district many wells were permitted to flow without restraint resulting in what the author calls "almost criminal" waste of gas.

Most satisfactory results in the entire Soviet were obtained in the Maikop-Kuban district in the northwest Caucasus near the Black Sea. Production in this district increased to 13,500,000 bbls. in 1938 compared to 10,000,000 bbls. in 1937. The Ural Permian basin produced 14,435,000 bbls. in 1938 compared to 9,700,000 bbls. in 1937.

Much of the paper on Soviet Russia dealt with the continued absence of efficient organization, lack of coordination between the sources of equipment supply and operating management and inefficient equipment. The absence of efficient transportation facilities and communication between the various oil districts, particularly links to the newer regions, are important factors in the relatively disappointing results attained in the Soviet industry. The author predicts a complete and radical reorganization of the entire industry will be necessary to bring material improvement in conditions.

Soviet refineries ran to stills about 195,000,000 bbls. of oil in 1938, approximately the same volume as in 1937. A further increase in internal consumption caused exports of petroleum to decline approximately 50 per cent.

The delay in receiving materials for refinery construction, repairs and expansion is similar to that experienced in the producing phase of the Soviet industry. A refinery at Moscow was under construction for a total of two and one-half years and another at Ufa, north of the Caspian, for three years.

Lack of pipe line transportation facilities for the newer producing districts renders them useless in Soviet economy at the present.

CUBA

By Roy E. Dickerson
Geologist
Atlantic Refining Co.

Production of the Bacuranao field fell off rapidly due to failure to drill new wells. In December the output was 15 bbls. per day. The Motembo area produced an estimated average of 160 bbls. per day. July production was 215,946 gallons of gasoline, 165 per day. Atlantic started a deep test in December upon a long narrow surfaced defined anticline 3 kilometers south of Remedios, a town on the north coastal plane of Santa Clara Province.

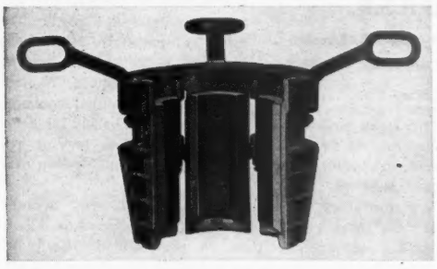
The Shell is starting a deep test in western Havana Province, 2 kilometers west of San Antonio de las Banos.

Atlantic is doing extensive seismograph and gravity meter work in Mantanzas and Santa Clara provinces.

New or Improved Equipment

Drillpipe Slips Made to Afford Long Life and Effectiveness

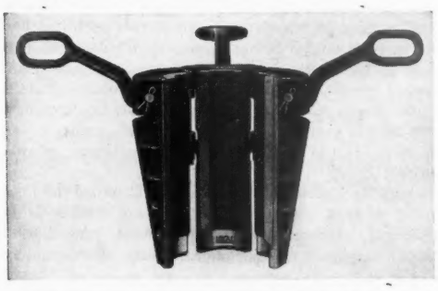
Two new types of drillpipe slips with three-piece hinged construction have been introduced by National Supply Co. They are designated as the



Ideal SK and BK slips, the former for handling average-length strings of drillpipe and the latter for extra-long strings. The Type BK slips are extra long and have been used successfully on some of the world's deepest wells.

Both types feature renewable liners with machined wickers. The liners of the SK slips have a 13-inch long gripping surface and the BK an 18-inch. The three-piece hinged construction permits practically a full grip around the pipe with a uniform bearing pressure that minimizes scoring of the pipe. This type of construction also assures uniform seating of the slips in the table bushing. A major part of the liner backing is effective and the backs are made extra wide to prevent grooving of the slip bowl.

These new National slips are constructed for



long life. Both the liners and the bodies are of alloy steel, heat-treated to improve their wear-resistant qualities. The liners, held in the bodies by large alloy steel bolts, can be quickly replaced.

The Type KS slips are adaptable for use in any table bushing. The extra-long BK slips are designed for the Ideal Type B table bushing which has an unusually deep slip bowl; however, they can be used in any standard table bushing when used with an adapter.

Here and There With Men Who Manufacture Equipment

At a meeting of the directors of Well Equipment Manufacturing Corp., Houston, Tex., the following officers were named: C. K. Stillwagon, president and general manager; S. Howard Smith, vice president; H. J. Hagn, secretary-treasurer.

Mark J. Lacey, president of the Peck, Stow & Wilcox Co., Southington, Conn., announces that the machinery and the tools and hardware divisions of Pexto have been amalgamated and placed under the sales direction of W. Roy Moore, for many years vice president and secretary of the Billings & Spencer Co. William O. Seifert, formerly manager of the machinery division, is now sales manager. Elmer J. Murray, traveling representative of the tools and hardware division, is now assistant sales manager. Floyd J. Neal, formerly manager of the tools and hardware division, is now manager of production.

Lloyd G. Ensign, 30 Rockefeller Plaza, New York, export representative for Lee C. Moore & Co., Inc., Grant Oil Tool Co., Brauer Machine & Supply Co., Hercules Tool Co. and Broderick & Bascom Rope Co. (Trinidad), will leave March 1 for South America. He plans to devote about three months to covering Venezuela, Colombia, Ecuador, Peru, Trinidad, Cuba, and possibly Brazil, for his principals.

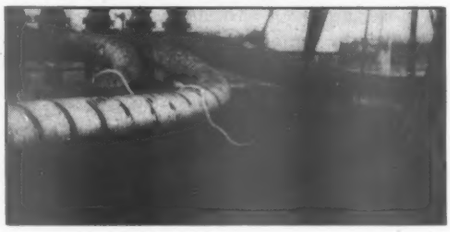
Robert W. Lea has been elected a vice president of Johns-Manville Corp., manufacturer of building materials and industrial products. Before taking the J-M post in which he will be in charge of finance, Mr. Lea was president of the West Virginia Coal & Coke Co., of which he will remain a director.

Frank M. Urban, formerly assistant to W. T. Keenan, manager of mechanical sales in the Chicago branch of the United States Rubber Co., has been appointed assistant manager of mechanical sales in the Chicago branch.

The Chase Welding Supply Co., Benton, Ill., has been appointed by the Air Reduction Sales Co. as an authorized dealer in Airco oxygen and acetylene and Airco welding and cutting apparatus and supplies. In addition, Wilson electrodes and National carbide will be carried in stock. Chase will serve customers in 20 counties in southern Illinois.

Service of 5,000 Hours Is Given by Synthetic Tube Oil Hose

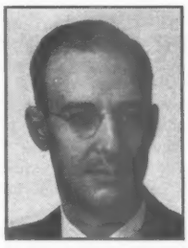
The middle hose shown in the accompanying picture is one of two sections of 8-inch Goodrich Type 400 synthetic tube oil hose which have com-



pleted over 5,000 hours of service on the docks of a large Texas oil company. During this 5,000-hour period these two sections of hose handled about 22,000,000 bbls. of oil. Since they are still in use, further additions to this service record are being made.

Poethig Joins Bastian-Blessing

Announcement has been made that Robert Poethig is now associated with Bastian-Blessing Co., Chicago, as assistant sales manager in charge of the liquefied petroleum gas equipment division.



Mr. Poethig has had many years experience in the engineering, manufacturing and selling of equipment for use with high-pressure gases. His addition to the organization enables the company to give further assistance on customers' problems.

FORMS DIVISION FOR WELDING AT THE WELL

H. C. Price Co., Bartlesville, Okla., has formed a special division of its organization to handle exclusively the electric welding of oil well casing at the well. A year and one-half was spent in investigation, preparation and research before actual operations were begun in the field. The first casing was welded by this company in Oklahoma in 1937 followed by a few wells in western Kansas early in 1938. Starting July 1, 1938, casing welding operations were begun in Illinois and since then over 300 strings have been welded.

The Illinois crews are composed of only experienced welders taken from the pipe line welding crews of the same organization. Only the latest type of welding equipment is used. Machines are mounted on trucks. Sufficient tractors are spotted throughout the field to assure prompt service even under the worst weather conditions. There are four crews operating in Illinois at the present time. E. J. Roth is in charge of the Illinois organization. Headquarters and warehouse are located at Effingham.

Many Operating Conveniences in Bridgeport's New Rotary

The new high-speed, completely enclosed, oil-bath, comparatively lightweight Gumbo Buster 17½-inch rotary placed on the market by Bridge-

port Machine Co., is said to have many operating conveniences and cost-saving features, among which are all-steel construction; long base fits standard derrick-sills, which eliminates the expense of installing false sills or of providing an extra skid base; lock dogs, controlled by conveniently located levers, which eliminates the necessity of changing dogs by hand and permits the use of a safety cover over the pinion-shaft; overhauling sprocket; other features ordinarily built only into the larger, more expensive rotaries.

The table opening handles 13⅜-inch O.D. casing and slips; 17½-inch fishtail bit; 16-inch rock-bit. It is recommended for drilling to 5,500 feet with 4½-inch drillpipe or to 3,500 feet with 6⅝-inch drillpipe. Complete specifications may be had by writing the Bridgeport Machine Co., Wichita, Kans., or the American Well & Prospecting Co., Corsicana, Tex.

Thornhill Touring South America

Charlie Thornhill, vice president of Thornhill-Craver Co., manufacturer of the Unibolt line of equipment, left Houston, Tex., recently on a three months' air tour of leading South American oil fields. He flew from Miami, Fla., to Barranquilla, Colombia, from which point he planned to travel through Colombian fields, thence through Ecuador, Peru and Chile, returning to the Maracaibo Basin in March. After an extended stop-over in and around Maracaibo he planned to tour eastern Venezuela and on to Trinidad. At Port of Spain he will be met by Mrs. Thornhill, who will accompany him through the southern part of the continent, including Rio de Janerio and Buenos Aires, Argentine. Mr. Thornhill will fly from Buenos Aires to Commodoro Rivadavia (Patagonia) in southern Argentina before beginning his return home in April.

Patent Decree Affirmed

During September, 1937, suit was brought in the United States District Court for the Northern District of Texas, Dallas division, by Price-Trawick, Inc., Stroud, Okla., plaintiff, versus Gas Lift Corp., defendant, claiming infringement of Patent No. 1,793,193 to Frederick Price, covering an apparatus for starting the flow of flowing wells. The device, distributed by Gas Lift Corp., is the Bryan flow valve, which the plaintiff, Price-Trawick, Inc., claimed to be an infringement of the patent to Frederick Price. This case, No. 3761-1017 in equity, was tried in the federal court in Dallas during February, 1938, and decision rendered in favor of the defendant, Gas Lift Corp., final decree in that court having been entered March 19, 1938, on the ground that there was no infringement. Within the prescribed time appeal was taken by Price-Trawick, Inc., plaintiff, and the case was argued in the United States Circuit Court of Appeals for the Fifth Circuit in New Orleans on January 3, 1939, being case No. 8921. Decision was again rendered in favor of defendant, Gas Lift Corp. in the opinion of the Circuit Court of Appeals, dated January 24, 1939, affirming the decree of the District Court for the Northern District of Texas.

Bulletins, Booklets, and Other Literature for the Trade

Landis Machine Co., Inc., Waynesboro, Pa., is offering an eight-page bulletin on Landis chaser-grinders.

An eight-page catalog section on its line of heavy-duty truck and bus and Diesel starting batteries has been issued by the B. F. Goodrich Co., Akron, Ohio. The section explains the construction of the battery line and gives specifications and plate dimensions on each of the batteries offered for a specific service.

A composite catalog, covering the entire "Caterpillar" line, has been issued for 1939 by Caterpillar Tractor Co., Peoria, Ill. Illustrated profusely with model photographs and cutaways to show mechanical features, the booklet gives brief specifications and operating data about every product built by the company.

A 40-page book, "Cold Weather Care of Acetylene Generating and Distributing Equipment," published by the Linde Air Products Co., 205 East Forty-second Street, New York, contains valuable suggestions for the proper maintenance of acetylene generators and associated equipment subject to freezing.

Meehanite Research Institute, Pittsburgh, Pa., announces an eight-page illustrated booklet, Form 100, describing and illustrating various adaptations of Meehanite to pumps faced with severe service requirements. Results of recent cavitation tests on different types of Meehanite are included. The booklet may be obtained by writing to Meehanite Metal Corp., Vandergrift Building, Pittsburgh, Pa.

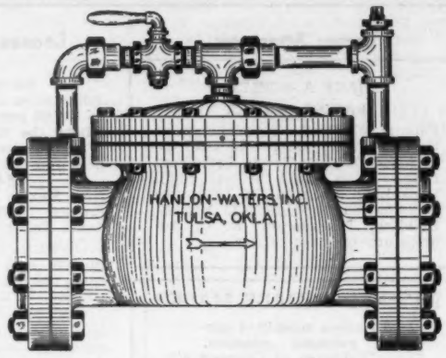
Technical Bulletin 10, obtainable from Babcock & Wilcox Tube Co., Beaver Falls, Pa., is devoted to the effect of silicon on the properties of certain of the most popular chromium-molybdenum steel tubes now being used in quantity by the refining industry.

Lane-Wells Executives Meet

At a sales convention of Lane-Wells Co. officials and executives held recently in Los Angeles, under the direction of Walter T. Wells, president, and Rodney S. Durkee, executive vice president, plans for the coming year were made. Sales in 1938 were the highest in the history of the company with the outlook for 1939 to exceed that record. An equipment construction program to meet the increasing demand for Lane-Wells services was outlined. M. E. Montrose and M. T. Higgs, Gulf Coast division manager and sales manager; R. B. McCullar and C. T. Casebeer, Mid-Continent division manager and sales manager; J. W. McPhee, California division manager, and D. M. Anderson, California electrolog superintendent, represented the company divisions. N. L. Dorn, chief engineer; C. H. Barnes, production engineer, and F. R. Shumack, assistant to the vice president, attended the sessions, which were held at the California Club.

Noairoil Tank Flow-Valve Has Many Features of Importance

The Type 297 Noairoil tank flow-valve for oil-field run-tanks, announced by Hanlon-Waters, Inc., Tulsa, is used to handle the flow of sweet or cor-

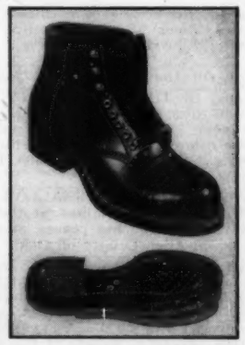


rosive oil from a single tank, or a battery of tanks, to a pipeline system. It always requires a positive liquid pressure head on the inlet side to cause the inner valve to open, irrespective of whether the outlet side discharges into a pressure or a vacuum. In case of a vacuum being created on the outlet side, the higher this vacuum becomes the tighter the tank flow-valve will seat, thereby preventing pulling vacuum on the tank. Whenever a pressure builds up on the outlet side, it will cause the inner valve to close and thereby prevent backflow into the tank with the possibility of overflowing. The principal advantages of the Hanlon-Waters Noairoil tank flow-valve are enumerated by the company as follows:

(1) Positive minimum level shutoff; (2) maintains positive pressure in tank under all conditions of flow; (3) no reversal of flow, eliminating necessity of run-line check-valves; (4) reduction of pipeline corrosion by preventing flow of air into gathering system; (5) no floats; (6) no trigger work; (7) no stuffing-boxes; (8) no flapper-valve; (9) no adjustments; (10) no manual operations, fully automatic; (11) cannot freeze; (12) cannot air-lock; (13) replaceable seats; (14) integral manual air release and by-pass; (15) no air or gas release hazard; (16) reduces running time; (17) reduces field gathering station pumping cost; (18) lowers field labor expense; (19) eliminates gravity and volumetric losses by air being pulled into the gathering system; (20) no oil is too heavy or light to be handled by the flow-valve.

"Oil Fighter" Safety Shoes Are Resistant to Oil and Grease

Lehigh Safety Shoe Co., Allentown, Pa., announces a line of steel-toe box safety shoes soled with Du Pont "Neoprene," a rubber compound that is highly resistant to oils, greases, and most caustics and solvents which cause rapid rotting of leather and ordinary rubber soles.



One safety-shoe pattern carries a full Neoprene sole. Two others are soled with cord moulded in Neoprene to provide additional traction on slippery surfaces. The shoes, sold under the trade name "Oil Fighters," are described in a new catalog issued by the Lehigh Safety Shoe Co.

CLASSIFIED ADVERTISING

Patent Attorneys

JACK A. SCHLEY
PATENT LAWYER

Patents obtained — infringement practice in all Courts—oil field experience. 1807-11 Tower Petroleum Bldg., Dallas. 2014 Second Nat'l. Bank Bldg., Houston. 707 Insurance Building, San Antonio. 433 Munsey Building, Washington, D. C. Address any of these offices.

PATENTS — TRADE MARKS

All cases submitted given personal attention.
Form **"Evidence of Conception"** with instructions for use and **"Schedule of Government and Attorneys' Fees—FREE**
LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

DRILLING deals wanted 50,000 acres Southern Illinois in and around production area. Elmer Gant, Anna, Illinois.

ILLINOIS 60,000 acres in and near production. Illinois Minerals Company, Cairo, Illinois.

SACRIFICE 40-acre Oil Lease, Chaves County, for only $10.00, full price. Guarantee title. P. O. Box 191, Clovis, N. Mex.

320 ACRES, Crane Co., Tex., Magnolia lease, cheap in fee. Address 415 Littlefield Building, Austin, Texas.

OIL and Gas Lease For Sale. My one-half interest in 204 A. Sec. 7. 4N. 6W. Grady Co., Okla. Also, 240 A. Sec. 14 and 15, 2N. 4W. Stephens Co., Okla. E. E. McDowell, Verden, Oklahoma.

5 ACRE Mineral Deed, Landowners Royalty under entire 80 acres of land leased to Gulf Oil Co. being N½ NW¼ sec. 30, twp. 14s, rge. 31e, full price only $32.50. Perpetual and full participating. Send your check. Guarantee delivery. P. O. Box 968, Hobbs, N. Mex.

WILL GIVE solid 600 acre block leases Breckenridge County, Kentucky for test well 1,250 feet deep or McClosky sand if productive anticipated at lesser depth. Address Owner. GUY J. STUMPFF, Box 1657, Fort Worth, Texas.

WILL GIVE genuine psychic maps showing drilling sites MONTGOMERY COUNTY, MISSISSIPPI to operator who will drill. Texas operators leasing near Kilmichael, Miss. Ideal shore line structure found, 4 oil sands less than 3,500 feet. No proration. Box 303, Memphis, Tenn.

NATURAL GAS: Offers good returns on your investment; shallow drilling. Good market. Low operating expense. Proven territory. H. W. Mitchell, 411 Pacific, Osawatomie, Kansas.

FOR SALE: 1200 Acre Illinois block of leases along known structure, 7 miles south of production. Address
Box J-862
The Oil and Gas Journal, Tulsa, Okla.

OIL IN THE FOREST CITY BASIN
200 of these books free. Request your copy on your letter head. 85,000 acres under lease offered in blocks for drilling agreements. NEKOLEXAS, Box 435, Lawrence, Kansas.

ALLEN CO., KY., SHALLOW FIELD. See or write C. L. Raines, Scottsville, Ky., regarding producing leases and drilling blocks in Allen County oil field.

NORTHEASTERN KANSAS ACREAGE on edge of Forest City Basin! Well now drilling in a very hot area, major operators leased around us. Shows exceptional promise. Up to 2,000 acres available. Quick action necessary to secure the best locations. Inquiry invited from Brokers or Investors. Address Helm & Associates, P. O. Box 93, Topeka, Kansas.

25,000 Acres, Carlisle, Ballard, and Hickman Counties, Western Kentucky. Drilling Deals wanted. Box #84, Bardwell, Ky.

Leases and Drilling Blocks

NEW MEXICO
State Oil and Gas Leases
Forty acres and multiples thereof at $6.00 to $30.00 per forty in the Hot Spots. Buy where the major companies own leases. Write for list. Twenty years in the business and not a complaint.
HARRY S. WRIGHT
New Mexico State Lessee, P. O. Box 166, Council Bluffs, Iowa, or P. O. Box 347, Santa Fe, N. M.

OWNER thousand acres of E. Okla. productive coal oil gas land; $15 fee, half cash, bal. in royalty, or $5 per a. lease or royalty. J. E. Cavanagh, Baker, Oregon.

WANTED: Partially developed or offset leases for immediate drilling. New Mexico preferred. Send full information to Box J-860, The Oil and Gas Journal, Tulsa, Oklahoma.

HOT SPOT LEASES
North Mo. $1.50 acre up. Some mile of well. Box 152, Milan, Missouri.

HAVE 200 ACRES in fee one and one-quarter miles north of development described on pg. 76 of Feb. 9th issue of The Oil and Gas Journal. Would like any reasonable proposition.
N. K. HARRIS
Box 323, Coudersport, Pennsylvania

SEMI-PROVEN acreage in Anderson Co. Kansas shallow Oil and Gas field, assigned for a well. If interested Come.—W. L. MORRIS, Garnett, Kansas.

3000 ACRES Illinois leases. Give drilling contract for small bonus. L. L. Livingston, 5057 Enright, St. Louis, Missouri.

SW Michigan 5000 acre block, well located, will sell or consider drilling propositions. R. Remington, Plainwell, Mich.

ONE-HALF interest in drilling well to shale gas and lease including equipment in to pipe line, $1,200.00. Near Cane well. Pipe line on lease. Market 10c per M. Offer made to citizens of Oklahoma. LAURENCE PRICE, Coweta, Oklahoma.

LEASE—S½ NW¼ 20-19-11. Well drilling 2,500' NE cor. SW¼ 21-19-11, Barton Co., Kans. $15 acre. Subject prior sale. Eastman, 2944 Wayne, Kansas City, Mo.

MAKE OFFER Lease on my ⅛ Undv Int SE¼ S.1 T 10 R.1 W & 7 A Royalty, Cleveland Co., 2½ Mi. SW. NEWALLA WILD CAT. Mrs. Anderson, 425 Ry. Ex. Bldg., Portland, Oregon.

Legal Blanks

SINCE 1908 Burkhart's legal forms—serving Mid-Cont. oil fields, including Ill., La. Mo. Ind. & Ky. Free catalog & samples. Burkhart Ptg. & Sta. Co., 115 So. Cinn., Tulsa, Okla.

Business Opportunities

MEMORNIAL PARK CEMETERY
FOR SALE

Established to serve a population of 50,000 people in the Rio Grande Valley near Harlingen, Texas. No competition, fully developed, very beautiful, promises large profits; more than $200,000.00, safe, pleasant occupation for retired man or active sales promotion. Total expenditure in development over $60,000.00. For business reasons must sell: Price $25,000.00 cash.

Also my residence is for sale: Located at La Feria: Five acres grapefruit and orange trees, many large palms, privet hedge around the property; many flowers and shrubs; swimming pool; five bedrooms; three baths; three car garage; three servant's rooms. One of best known properties in the Valley.

Will protect Agent who makes the sale on basis of 5% commission. Write or wire for appointment to inspect:
A. F. PARKER
LA FERIA, TEXAS.

Desirable water front bulk plant, Westchester County, adjacent Long Island Sound, storage tanks, garages, office, warehouse, long lease, reasonable rental. Address Box J-886, The Oil and Gas Journal, Tulsa, Oklahoma.

Wanted

WANTED—To buy casinghead gasoline plant now operating and producing from ten to twenty thousand gallons per day. Prefer Arkansas, Louisiana, or South Texas. Give specifications of equipment, location, and price. Address L. RUDMAN, Box 2018, Tyler, Texas.

For Sale—Maps

1939 EDITION MAP OF TEXAS
and Eastern New Mexico shows all OIL and GAS FIELDS up to date
$1.00 per copy
WILDCAT MAP published monthly on same area $3.00 per copy $30.00 one year.
ZINGERY OIL MAP COMPANY
Fair Bldg. Fort Worth, Tex.

WEST TEXAS HANDY OIL MAPS
Complete coverage on all West Texas Fields, showing operators, farm names, total depths and exact well locations. $10 per month. Individual maps 50 cents each. Box 2519, Tulsa, Oklahoma.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

Producing and Non-Producing
OIL ROYALTIES
Registered Dealers Only.
GRIMES ROYALTY CO.
Hunt Bldg. Tulsa, Okla.

PRODUCING OIL ROYALTIES
15 years of experience.
L. H. WITWER
703 Kennedy Bldg., Tulsa, Okla.

WILL BUY non-producing landowners royalty—under drilling wells only. P. H. HAWLEY, 727 W. 7th St., Los Angeles, Calif.

OWNERS of fractional landowners royalty interests still paying send full details to City Investing Co., 434 Roosevelt Bldg., Los Angeles, Calif.

Survey Service

OIL FINDING DOWSING METHOD
My deductions a practical method which picks up vibratory reactions emanating from carbo-hydrates. Physico method finds oil, locates faults. Same method discovered great East Texas field also our Watson #2 first producer Wilmington, Calif. field. Employ a man that owns producing wells. I find oil if it exists or no charge. George Miller, 1548 Post, Torrance, California.

Contractors

NORTHWEST Missouri—We have light, modern, all-steel, truck mounted spudders for shallow information holes to marker limes in Forest City basin. Drillers familiar with formations. Office close to area. Also have spudders for deep wildcat holes. References. J. D. Judd & Son, Martin City, Mo. 6 miles south of Kansas City on Holmes St. Phone Dwight 3273.

WE will contract your Ditching and Bulldozer work. Also have Pipe Line Equipment for rent or sale. Kova Pipe Line Co., 503 Tradesmen Bldg., Oklahoma City, Okla.

Geophysical Service

THE USE OF geochemistry is a most logical means of attacking the oil exploration problem. Soil analyzing surveys are reasonable. Write for details. Address Box J-870, The Oil and Gas Journal, Tulsa, Oklahoma.

Financing

CAPITAL SEEKERS—Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

Incorporations

DELAWARE CHARTERS: **Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.**

CHARTERS — **Delaware best, quickest, cheapest, more liberal. Free forms. Colonial Charter Co., Wilmington, Del.**

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgement is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.25*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	*1 time*	*$5.00*
1 Inch	*13 times*	*4.50 per inch*
1 Inch	*26 times*	*4.00 per inch*
1 Inch	*52 times*	*3.50 per inch*

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

COMPLETE REFINERY

—All or Any Part—

Two 253 h.p. Heine Straight Tube Boilers A.S. &M.E. 200 lbs. pressure. Complete with oil and gas burners. In service less than eight months.

Complete 6,000 bbl. Winkler-Koch pipe still with Winkler-Koch distillation bubble tower 8'6" diameter by 78' high.

One Burrel-Mase fractionator Type E-48-20 Series 600-48, 4' diameter by 51'6" high. 20 trays with bolted manhole on each tray, with separate reboiler and connecting piping.

Complete inventory furnished on request

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba,
Riverview at Second, Kansas City, Kansas

H. A. Gulley
Port Lavaca, Texas

Robt. W. Duden,
2100 S. Union, Tulsa, Oklahoma

Steam Equipment For Sale

4—125 H. P. 200 W.P. Broderick Boilers.

1—125 H. P. 325 W.P. Broderick Boiler.

4—125 H. P. 300 W. P. Broderick Boilers.

1—20" Gardner Denver Steam Pump.

2—18" Lucey Steam Pumps.

2—18" Wilson Snyder Steam Pumps.

2—12 x 12 Johnson Drilling Engines.

1—12 x 12 Ideal Drilling Engine.

1—6" Unitized Johnson Draw Works.

1—7½" Unitized R. B. Union Tool Draw Works.

1—6" T. I. VV. Draw Works Steel Jack Posts.

3800' 4½" Grade "D" Seamless 16.60# A. P. I. Drill Pipe.

6700' 3½" Grade "D" Seamless 13.30# Drill Pipe Hughes Acme Tool Joints.

We also have Rotary crown blocks, traveling blocks, hooks, swivels, etc. Bargains Only. Terms.

Melton Supply Co.
Seminole, Okla.

FOR SALE at Bartlesville: 1—2A National Drilling Machine, I. T. I. O., Bartlesville, Oklahoma.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St. Cincinnati, Ohio.

BUDA MOTOR
90 H.P. Like new, only $275.
R. D. JAMESON, La Cygne, Kansas.

FOR SALE—IMMEDIATE DELIVERY COMBINATION ROTARY AND CABLE TOOL RIG DEMONSTRATOR—NEW MACHINE GUARANTEE.
Factory Reconditioned
Drilled only four 3,000-ft. rotary holes in Illinois Basin for major oil company.

BRIEF SPECIFICATIONS
Capacity 3,500'-4,000'-4½" drill pipe. Skid mounted—for use under standard rig derrick. Diesel engine—Hercules 6-cyl.-160 H.P. Rotary table—National-20". Drawworks—2-speed and reverse—gear driven. Twin Disc clutches. Cat heads—dual. Sand and calf reel—two-speed and reverse. All gears cast steel—cut teeth. All principal shafts hammer forged, with anti-friction bearings. Reverse gear—fully enclosed—running in oil. Derrick—56' telescopic with dual rubber shock absorbers and braces can be furnished if desired. Bucyrus-Erie high quality material and workmanship throughout. Approximate weight without rotary table 32,000 lbs. For price and further information wire, phone or write

BUCYRUS-ERIE COMPANY
(Att'n. H. C. Neely) Evansville, Indiana
or South Milwaukee, Wis.

FOR SALE—HUGHES J CORE BARREL, takes 10' cores, only cored 200' of soft formation, have hard and soft formation heads. Excellent condition. Priced to sell. J. D. JUDD & SONS, Martin City, Missouri.

REDUCE MAINTENANCE COSTS!
CAR REPAIR PARTS
50% SAVING!
USED TANK CARS, LOCOS., ETC.
IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Avenue
Chicago, Ill.
"Anything containing IRON or STEEL"

FOR SALE 45 Star Spudder Complete with tools and equipment, 13 inch down to 6⅝ inch. Also 60 Caterpillar tractor. J. L. Gardenhire, Centralia, Illinois.

FOR SALE: Used large capacity positive and orifice gas meters. Geo. R. Milner, Okmulgee, Oklahoma.

Oil Well 18' Power and Idler. 40 H.P. Black Bear Gas Engine Belts, Metal Buildings and Circulating Tank. A-1 condition. Priced for quick sale.

DAVE MORGAN OIL COMPANY
P. O. Box 549
Blackwell, Oklahoma.

15,000 ft. number one 4" flues. Will sell in line or take them up. Priced to sell. M. J. REGAN, Coffeyville, Kansas.

FOR SALE: At our Oklahoma City Warehouse Model D48 Muskogee Iron Works long line well servicing unit powered by HXE Hercules engines mounted on No. 55 truck. I.T.I.O., Bartlesville, Oklahoma.

FOR SALE: Complete gasolene rotary rig with 80 horse motor on pump 200 horse on draw works 2200' of 4" drill stem located Sam Fordyce, Texas, $7500.00. Address C. C. Bishop, 1911 Esperson Building, Houston, Texas.

230 H. P. Cooper Bessemer Compressors, Power cylinders 17 x 20 Compressor cylinders 6¼x12½x20, 1000 pounds on high stage or will convert into compressors suitable for high pressure recycling. These compressors are in first class condition. Box 59, Seminole, Oklahoma.

FOR SALE: One complete steam rotary rig with 4" drill pipe, 90 H.P. Broderick Boilers completely equipped and in shape to drill immediately. Located on the Tucker lease out of Haven, Kansas. For further information contact the Viking Drilling Company, c/o Yingling Chevrolet Company, Wichita, Kansas.

Equipment Wanted

WOULD be interested in obtaining one used Octane Determination Machine to be C. F. R.-L.-3 method. Address Box J-863, The Oil and Gas Journal, Tulsa, Okla.

USED TRANSITS WANTED
No junk, antiquated, or worn-out instruments wanted—must be permissible to repair to shape like new. Write full particulars to
P. O. BOX 6005, Houston, Tex.

WANT POTENTIOMETER type Temperature Controller. HOME OIL, Humboldt, Saskatchewan, Canada.

CASH FOR IDLE STORAGE
We will buy at any location steel storage tanks. Send full information and location to—
P.O. Box 168, Tulsa, Okla.

Information

MY mimeographed bulletin, "The Money Market Offered by Insurance Companies" with list of 83 leaders $3.00 was a scoop. Government now studying the field! Another scoop, "New Type Capital Financing by Banks," bulletin form, $1.00. America's 72 leading underwriters of securities who bought $800,000,000 in 1938 $3.00. JOHN MORRIS, 1040 South Paxton Street, Philadelphia, Penna.

Situations Wanted

REFINERY Operator and Chemist desires location. Experience in still operation, cracking, lube mfg., treating, etc. Management experience. Address Box J-852, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE PETROLEUM ENGINEER—14 years' experience in production and geological work. Several years in supervisory capacities. Supervision of drilling and development a specialty. Desire connection with reliable firm. References if needed. Address Box J-882, The Oil and Gas Journal, Tulsa, Oklahoma.

DESIRE connection with company or individual developing oil property, operation or installation of natural gas plant as employee or partner. Graduate engineer, 20 years' operating experience, 4 years with state service Comm. Address Box J-832, The Oil and Gas Journal, Tulsa, Okla.

Complete coverage of pipe lines and refineries in Texas and Louisiana. Can handle another account, commission basis, with exclusive territory rights. Fourteen years in field. Technically competent. Address
Box J-880
The Oil and Gas Journal
Tulsa, Oklahoma.

PET. Engr., married. Some experience with oil companies in Mid-Continent fields. Address Box J-871, The Oil and Gas Journal, Tulsa, Oklahoma.

Young man, 16 years' continuous and broad, practical experience in petroleum industry desires position as production superintendent in Lubbock-Big Spring, Tex., areas. Experience includes majors and independents, proration umpire, cable and rotary tools, superintendence of drilling and producing properties, etc. Executive ability. Will accept reasonable salary. Address Box J-884, The Oil and Gas Journal, Tulsa, Oklahoma.

Want Position. Man with 7 years' experience in oil fields and 12 years in refinery, supervisor most of time. Anything considered. References. Address Box J-883, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

WANTED: Manufacturers' Representative with experience in selling Valve Cups. Must be active and have good connections with western supply stores and oil companies. Give full particulars. Address Box J-861, The Oil and Gas Journal, Tulsa, Oklahoma.

ORGANIC CHEMIST of ability preferably with doctorate, with experience along following lines desirable but not essential: Manufacture of ethylene glycol, formaldehyde, etc. from petroleum or natural gas, catalysis as related to polymerization or cracking by hydrocarbons for research and development work in the Middle West. An opportunity for a capable man. Give details of education, experience, age, nationality, salary. Address Box J-881, The Oil and Gas Journal, Tulsa, Oklahoma.

Man capable of Superintending erection and operation of small skimming plant Chicago area. State qualifications and salary expected. Address Box J-885, The Oil and Gas Journal, Tulsa, Oklahoma.

Mailing Lists

ROYALTY Lists. Unit Owners Lists. Stockholders Lists. By states. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Oklahoma.

If we do not maintain a classification exactly suited to the type of advertisement you wish to run, we shall be glad to create a fitting one.
Classified Department

Rocky Mountain Runs

Production estimates for week ended February 18:

WYOMING

	Bbls.
Salt Creek	15,120
Big Muddy	1,210
Elk Basin	560
Frannie	1,690
Garland	1,890
Grass Creek	1,830
LaBarge	820
Lance Creek	12,200
Lost Soldier	1,860
Medicine Bow	2,270
Oregon Basin	1,300
Osage	780
Quealy dome	730
Rock River	3,050
Poison Spider	270
Wertz	1,250
Miscellaneous	1,200
Total Wyoming	48,030

MONTANA

Border	120
Cat Creek	560
Cut Bank	8,130
Dry Creek	230
Kevin-Sunburst	3,290
Lake Basin	10
Pondera	440
Total Montana	12,780

NEW MEXICO

Cooper	4,150
Eaves	790
West Eunice	100
Eunice	22,260
Hardy	3,050
Hobbs	12,900
Jal	940
Langlie	4,690
Lynch	500
Lynn	800
Mattix	3,500
Monument	22,880
North Lynch	40
Penrose	5,590
Rhoades	140
Skaggs	120
Skelly	1,900
South Eunice	3,150
South Lovington	150
Vacuum	7,300
Artesia-Maljamar	8,520
Getty	100
Hogback	200
Rattlesnake	530
Table Mesa	70
Total New Mexico	104,370

COLORADO

Florence	100
Fort Collins and Wellington	310
Wilson Creek	310
Iles dome	2,090
Moffat	310
Orchard	20
Rangely	20
Tow Creek	130
Price	560
Total Colorado	3,850

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